south moresby

land use alternatives

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resource planning team

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PARTICIPANTS

The following individuals contributed to the planning process through their efforts as representatives or through technical and administrative support:

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Bristol Foster	Ecological Reserves Unit
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Rolf Schmitt Ron Smyth Tom Schroeter	Ministry of Energy, Mines and Petroleum Resources
Ron Bronstein Bill Dumont	Western Forest Products Ltd.
Gary Edenshaw Richard Wilson	Skidegate Band Council
Jack Miller Mary Morris	Public Representatives
John Broadhead Thom Henley Dan Bowditch Paul George	Islands Protection Society

Terry Allen and Colin Harivel contributed substantially as official observers for the B.C. and Yukon Chamber of Mines.

Pem Van Heek of the Ministry of Forests was actively involved in the discussion of landscape management issues.

FOREWORD

The South Moresby Resource Planning Team was organized by the Ministry of Forests in March of 1979 under the authority of the Environment and Land Use Committee (ELUC) of the Provincial Cabinet. The team consists of 12 representatives from the following federal and provincial government agencies, the forest industry and the public:

Federal Government

Department of Fisheries and Oceans.

Provincial Government

Ministry of Forests

Ministry of Lands, Parks and Housing
- Lands and Housing; Regional Operations
- Parks and Outdoor Recreation Division
- Ecological Reserves Unit

Ministry of Environment

Ministry of Energy, Mines and Petroleum Resources

Public/Industry

Western Forest Products Ltd.	- the major T.F.L. licensee in the area
Public Representative	- appointed to provide continuity with the Forest Service Public Advisory Committee, and to address concerns at large.
Islands Protection Society	- originators of the South Moresby Wilderness Proposal
Queen Charlotte Islands Museum	- representing the views of heritage site professionals generally, and its own interests.
Skidegate Band Council	- representing Haida interests as well as an unsettled land claim.

The team is chaired by Mr. Nicholas Gessler of the Queen Charlotte Islands Museum.

In addition, the B.C. and Yukon Chamber of Mines, the Moresby Island Advisory Planning Commission, Ecosummer Canada Expeditions Ltd., and Parks Canada have served as official observers.

The team has been directed in its terms of reference to provide:

i. an evaluation of the ecological reserve proposals for the Windy Bay watershed and Dodge Point, considering the ecological and commercial timber values of the area;

ii. specific proposals for land use designations for South Moresby Island, with reference to wilderness, recreation and other natural values, and the timber harvesting rights embodied in Tree Farm Licence 24; and

iii. environmental management guidelines, specifically for watersheds, marine shorelines, unstable soils and scenic landscapes.

The team presented two proposals for an ecological reserve at Windy Bay/Dodge Point in an earlier report submitted to the ELUC (British Columbia, 1981). The following report on land use alternatives for the South Moresby study area is the second formal submission to government. The environmental management problems are viewed as a third phase which can only be developed after the general land use directions for South Moresby have been established. The continuing work of the planning team is dependent on further direction from the ELUC.

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SUMMARY

The southern portion of Moresby Island has been the subject of an interdisciplinary planning project since the establishment of the South Moresby Resource Planning Team in 1979. The conclusions and findings of the team are embodied in this final report to the Environment and Land Use Committee. The opening section describes the physical setting and land status of the study area, followed by the history and background of the South Moresby land use issues. The various tasks of the planning process are described in Section 2.0. The issues surrounding public involvement, the comparison of non-economic values with economic resources, and mineral claim-staking in South Moresby are highlighted.

The natural resource values of South Moresby have been categorized and described in Section 3.0. This section provides a baseline for assessing alternative approaches to land use. The natural environment refers to the geology and physiography, climate, vegetation, wildlife and aquatic ecosystems. An important aspect of the natural environment is the occurrence of endemic or otherwise distinctive species of flora and fauna in South Moresby.

The numerous Haida archaeological sites and the abandoned villages of Anthony Island, Tanu and Skedans are evidence of the rich cultural heritage of South Moresby. South Moresby is one of two essentially intact yet distinct areas on the islands which have been identified as being vital for the preservation of the Haida heritage. This heritage has been augmented by activities in recent history which centered around the early mining, fish processing and forest industries. South Moresby has also provided important subject matter for west coast artists.

The wilderness and recreation values are related to spectacular rugged scenery, intricate shorelines, diverse marine environments and wildlife. The environment provides opportunities for boat touring, sports fishing, hunting, camping, scuba and skin-diving, beachcombing and photography. The numbers of commercial recreation tours offered in the area have increased in recent years. It is emphasized that the recreation values are derived not only from the recreational features, but from the general wilderness character of South Moresby and the experience that it offers.

The fisheries, timber and minerals of South Moresby are important commercial resources. Eighty percent of the total Queen Charlotte herring catch along with an important salmon fishery is attributed to the streams and marine waters. The timber supports an annual rate of harvest of approximately 262 000 m^3, most of it from Tree Farm Licence 24. Approximately 24 percent of the study area is under mineral claim, the majority of which has been staked since 1979 as a result of the recent gold interest. The current economic value of the mineral industry is derived from exploration activity only, and would increase substantially in the event of actual production.

The land use planning exercise for South Moresby utilized two major land use zones. Each zone is presented with a primary management objective, a management strategy, and an indication of the formal land status that could apply.

> Natural Zone emphasizes the retention of a natural undisturbed state, and compatible land uses involving traditional Haida activity, wilderness recreation, scientific research and education. Natural Zone areas would preclude timber or mineral extraction, and would likely be implemented as national or provincial park, possibly in combination with provincial forest.
>
> Resource Development Zone emphasizes the production and harvesting of timber, mineral exploration and development, and the management and protection of other values consistent with the philosophy of integrated resource management. Resource Development Zone areas would remain either in the Tree Farm Licence (T.F.L.) or the Queen Charlotte Timber Supply Area (T.S.A.).

Four land use options involving various arrangements of Natural Zone and Resource Development Zone have been developed for South Moresby. These options are shown in Figures 19 - 22, p. 149 to 152. The options are a series ranging from a resource development priority (Option 1) to a wilderness preservation priority (Option 4) for the area. The options reflect the view that wilderness recreation opportunities are best provided in large, contiguous areas of Natural Zone that are separated as much as possible from Resource Development Zone. This approach is evident in Options 2 to 4, which provide a progressively larger block of Natural Zone in the southern portion of the study area.

The land use options have been evaluated in Section 5.0 with regard to the costs and benefits affecting the resource values identified in South Moresby. Important parameters of the evaluation include:

i. the protection of natural environment values;
ii. the potential risk to archaeological sites;
iii. available recreation opportunities, particularly in a wilderness setting;
iv. potential risk to freshwater salmonid spawning and rearing habitat;
v. reduction of net operable forest land, rate of harvest, and associated economic activity; and
vi. potential removal of mineral lands from exploration and development.

The reader is referred to the text for details of the evaluation of all four land use options. Options 1 and 4 may be examined to briefly illustrate the range of impacts. In general, the realization of natural environment, recreation and wilderness values varies directly with the proportion of area in Natural Zone. Option 4 therefore protects virtually all significant natural environment values, and retains the current potential for recreation use in a wilderness setting. The natural environment is exposed to the relatively greatest potential risk in Option 1, and while some recreation features are afforded protection, the wilderness values are largely foregone.

The benefits from resource development similarly depend on the configuration of Resource Development Zone in each option. Option 1 provides for future timber harvesting over 97 percent of the net operable timber in South Moresby, or 22 percent of the total land area. The reduction in the contribution to rate of harvest amounts to 1.1 percent from the T.F.L. and 0.6 percent from the T.S.A. Approximately 31 to 33 percent of the area would be removed from future mineral exploration and development. In contrast, 28 percent of the net operable forest (seven percent of the total land base) is available for forest management and harvesting in Option 4. This translates into a 37.0 percent reduction in the T.F.L. rate of harvest, and 4.5 percent from the T.S.A. Between 75 and 95 percent of the area would be removed from mineral development.

It should be noted that the analysis of land use options for South Moresby has been constructed without reference to the ecological reserve proposals for the Windy Bay watershed and Dodge Point on eastern Lyell Island. A land use decision for South Moresby must, however, address the two options presented in the report of the planning team submitted in December 1981. Option A provides for ecological reserve status over the entire watershed. Option B would reserve the slopes of Dodge Point and the lower Windy Bay valley. The net costs and benefits of a given land use option will be affected to some degree when combined with either of the Windy Bay options.

The actual implementation of a selected land use strategy requires resolution of a number of important issues which are discussed in this report, but which were not subject to consensus among team members:

> Mineral resource management - The Natural Zone in all four land use options limits mineral exploration to existing mineral claims. This is contrary to the objective of the Ministry of Energy, Mines and Petroleum Resources for multiple land use planning. The Ministry has presented an alternate approach that would permit controlled mineral exploration and development over most of South Moresby, regardless of the selected option. Although presented, this approach has not been endorsed by the planning team (see Section 4.3, p. 154).

Marine environment - Federal jurisdiction and policies over marine resources has made it difficult to define possible management strategies in a planning exercise established under the authority of the provincial government. Specifically, the Department of Fisheries and Oceans at the planning team level has not been able to devise strategies for marine resources that cover as broad a spectrum as those considered for upland resource management. It is recommended that, immediately following a final land use decision, the Province initiate discussion with the Government of Canada with the aim of formulating a suitable management strategy for the marine environment (see Section 4.1.3, p. 146, and 7.2 p. 221).

Compensation - Withdrawals of net operable forest land from either the Tree Farm Licence or Timber Licences for purposes of wilderness preservation would have to be compensated by the Crown to the extent that prescribed, legislated limits have been exceeded. Compensation of licensees may be in the form of timber or cash. An opinion has been advanced that, if compensation is necessary, a land withdrawal from T.F.L. 39 to replace equivalent Crown land in T.F.L. 24 would be an appropriate compensation strategy. The Ministry of Forests has forwarded an interpretation of the compensation provisions of the FOREST ACT which would preclude such action (see Section 5.5.3, p. 196).

A number of specific resource planning tasks must be undertaken following a formal land use decision for South Moresby. Detailed environmental management prescriptions have not been developed in this report. In the absence of an overall land use plan, it is not currently feasible for the planning team to recommend precise terms of reference for future work. Important requirements for additional planning have nonetheless been listed in Section 7.0.

1.0 INTRODUCTION

1.1 The Study Area

General Description

The South Moresby study area is located in the southern portion of the Queen Charlotte Islands, as shown in Figure 1. The area includes a large segment of Moresby Island and numerous adjacent islands, the largest of these being Lyell Island, Burnaby Island, and Kunghit Island. A general map of the study area is provided in Figure 2.

From the Tangil Peninsula in the north to Cape St. James in the south, the study area extends in a long narrow triangle for approximately 110 kilometres. The widest dimension, about 35 kilometres, occurs near the northern boundary. The study area contains about 145 000 hectares of upland which constitutes about 15 percent of the total area of the Queen Charlottes.

The study area also embraces a considerable area of foreshore, as well as a large marine component. The outer boundaries of this marine component have not been clearly defined, but all waters within several kilometres of the shoreline should be considered as falling within the study area.

Present settlement in the South Moresby is largely confined to the temporary logging community at Powrivco Bay on northern Lyell Island. Major population centres on the Queen Charlottes are located well to the north of the study area, the nearest centre being Sandspit which is situated about 60 kilometres north of Lyell Island. The study area has no road connections to other parts of the Queen Charlotte Islands, and therefore access is by air and water only.

Over time, a number of appellations have been applied to this area, including: South Moresby Wilderness Proposal, South Moresby Study Area, and South Moresby Planning Area. Throughout this report the study area will be referred to simply as South Moresby.

Land Status

South Moresby is almost entirely Crown land, notwithstanding the Haida claim of hereditary title. Private land is confined to one relatively small holding at Rose Harbour on northern Kunghit Island (Figure 3). Anthony Island, located near the south end of the study area, is currently a Class A Provincial Park and has been formally designated as a World Cultural Heritage Site by UNESCO. Ecological reserves have been established over the Kerouard Islands, the islets surrounding Anthony Island, Rankine Island, and East Copper Island. St. James Island is reserved for lighthouse purposes. There are two Indian reserves in the study area, at Skedans and Tanu.

Figure 1 LOCATION OF SOUTH MORESBY STUDY AREA

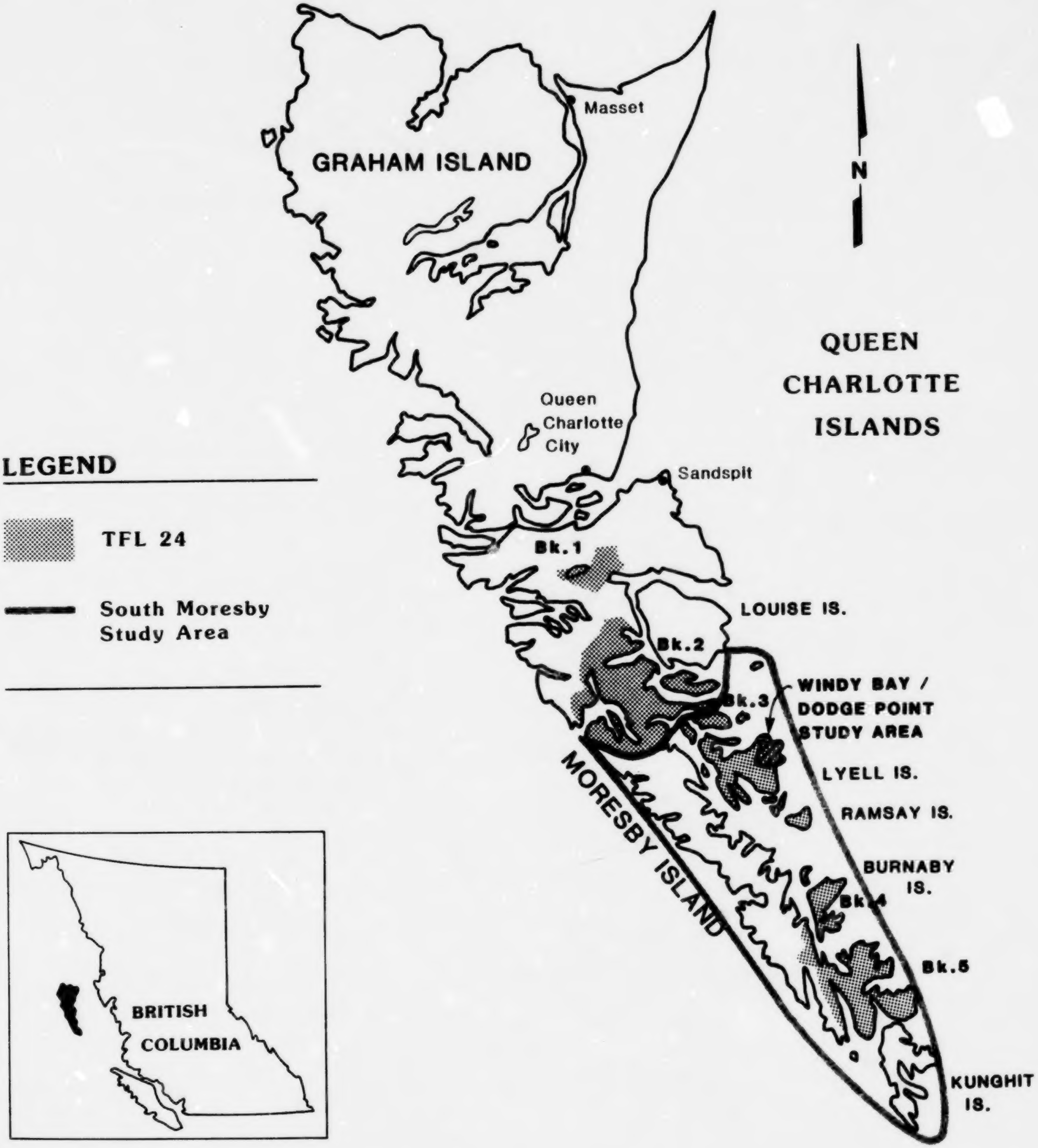

GRAHAM ISLAND
Masset
N
QUEEN CHARLOTTE ISLANDS
Queen Charlotte City
Sandspit
LEGEND
TFL 24
South Moresby Study Area
Bk.1
LOUISE IS.
Bk.2
Bk.3
WINDY BAY / DODGE POINT STUDY AREA
LYELL IS.
RAMSAY IS.
MORESBY ISLAND
BURNABY IS.
Bk.4
Bk.5
KUNGHIT IS.
BRITISH COLUMBIA

Figure 2 GENERAL FEATURES OF SOUTH MORESBY ISLAND

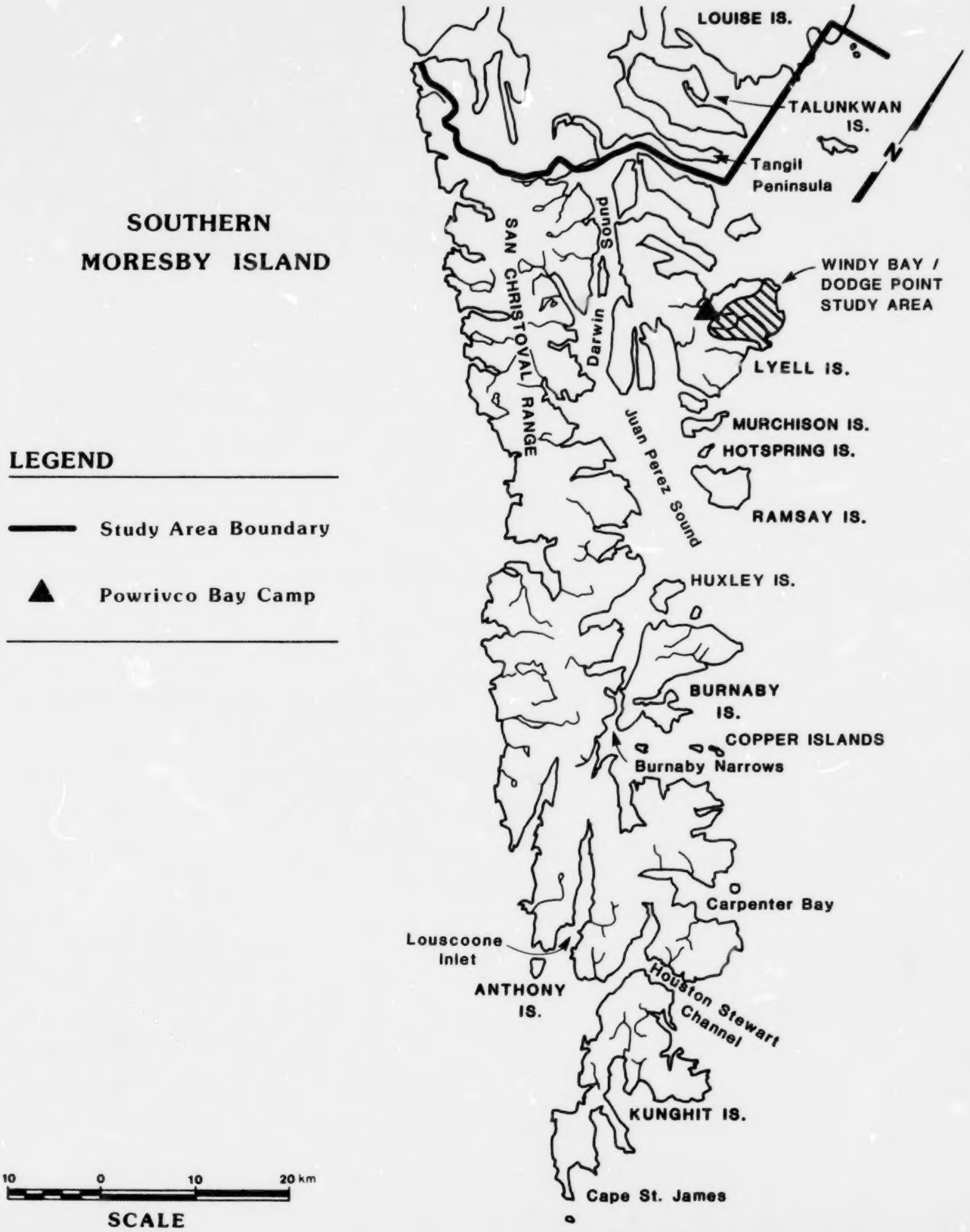
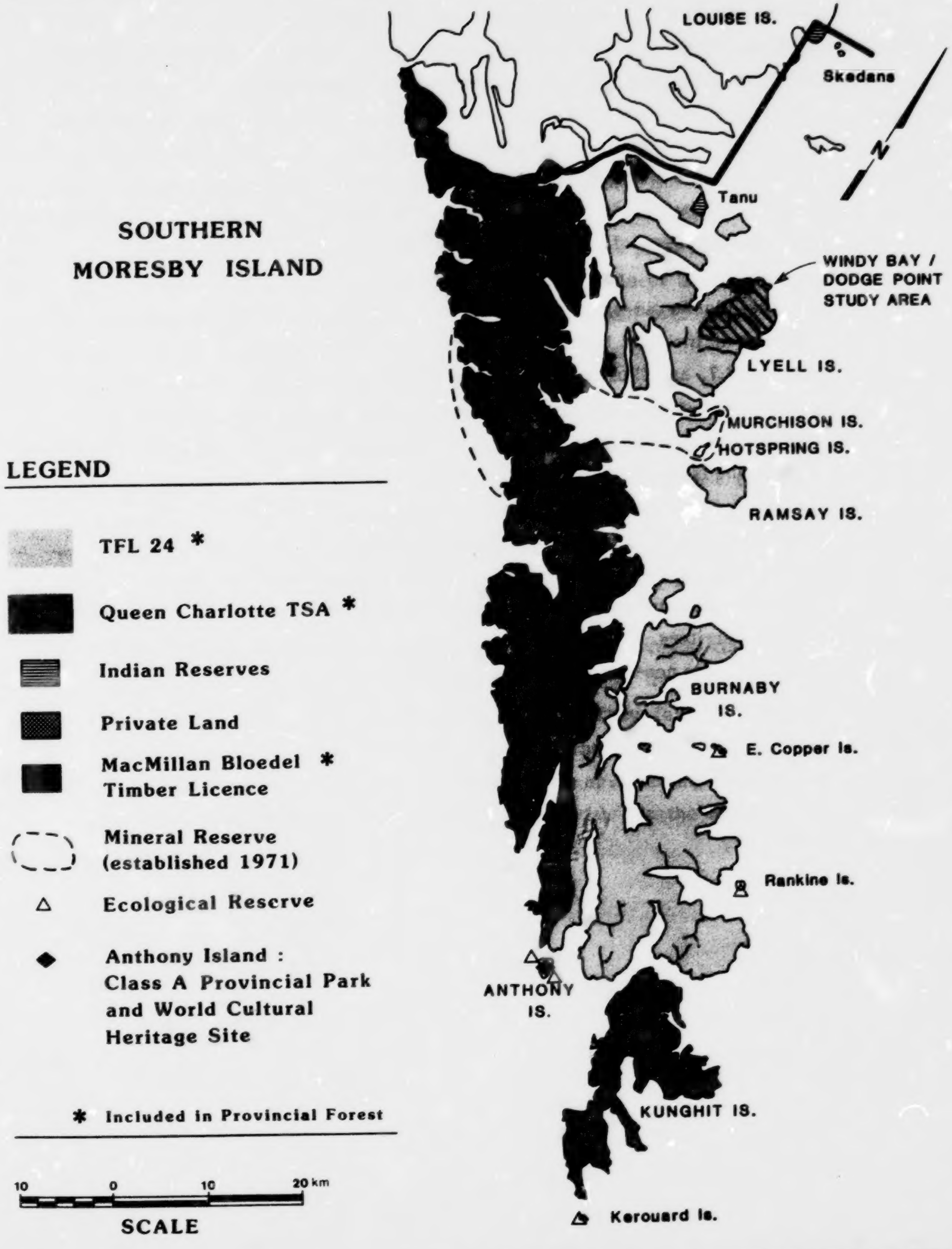

SOUTHERN MORESBY ISLAND
LEGEND
Study Area Boundary
Powrivco Bay Camp
LOUISE IS.
TALUNKWAN IS.
Tangil Peninsula
N
WINDY BAY / DODGE POINT STUDY AREA
SAN CHRISTOVAL RANGE
Darwin Sound
LYELL IS.
MURCHISON IS.
HOTSPRING IS.
Juan Perez Sound
RAMSAY IS.
HUXLEY IS.
BURNABY IS.
COPPER ISLANDS
Burnaby Narrows
Carpenter Bay
Louscoone Inlet
ANTHONY IS.
Houston Stewart Channel
KUNGHIT IS.
Cape St. James
10
0
10
20 km
SCALE

Figure 3 SOUTH MORESBY ISLAND LAND STATUS


SOUTHERN MORESBY ISLAND
LOUISE IS.
Skedans
N
Tanu
WINDY BAY / DODGE POINT STUDY AREA
LYELL IS.
MURCHISON IS.
HOTSPRING IS.
RAMSAY IS.
BURNABY IS.
E. Copper Is.
Rankine Is.
ANTHONY IS.
KUNGHIT IS.
Kerouard Is.
LEGEND
TFL 24 *
Queen Charlotte TSA *
Indian Reserves
Private Land
MacMillan Bloedel * Timber Licence
Mineral Reserve (established 1971)
Ecological Reserve
Anthony Island : Class A Provincial Park and World Cultural Heritage Site
* Included in Provincial Forest
10
0
10
20 km
SCALE

The remainder of the Crown land in the study area lies within the Moresby Provincial Forest. Blocks 3, 4 and 5 of Tree Farm Licence 24, held by Western Forest Products Limited, are situated within South Moresby and occupy approximately 39 percent of the study area. Blocks 1 and 2 of this licence are located north of the study area, on northern and central Moresby Island. Most of the remaining Crown forest within the study area is administered as a portion of the Queen Charlotte Timber Supply Area. In addition, MacMillan Bloedel Limited holds four Timber Licences in the area which in total occupy less than one percent of the study area's land surface.

Mineral claims currently exist throughout eastern South Moresby, covering 25 percent of the land base. The distribution of claims is discussed further in Section 3.7, and illustrated in Figure 17. A reserve from mineral staking is presently in effect in an area near De la Beche Inlet on Moresby Island, and on the Bischof Islands, Murchison Island, Hotsprings Islands, and several other islands and islets in this general vicinity.

The entire South Moresby area is distributed among nine registered traplines. These tenures give the registered trapline holders exclusive rights to trap within the designated trapline area. South Moresby is also within a certified guiding territory. This tenure gives one licenced guide outfitter exclusive rights to guide non-residents to hunt big game in South Moresby.

1.2 History and Background

The South Moresby Wilderness Proposal

For many years the South Moresby area of the Queen Charlotte Islands has been regarded as a place of special natural features. Although a longtime favorite of local residents and adventurous mariners, wider public concern over preservation from resource extraction grew throughout the 1960's and early 1970's. In 1971 the Provincial Parks Branch identified the Hotsprings Island-De la Beche Inlet region as a prime park candidate, and initiated the establishment of a mineral reserve (Figure 3) as a preliminary requirement for creation of a park. Shortly thereafter, the whole of South Moresby became the subject of a much broader land allocation controversy, and no park status was implemented.

A conflict began in October of 1974 and centered around Tree Farm Licence 24, held by Rayonier Canada (B.C.) Ltd. This Tree Farm Licence (T.F.L.) was granted in 1958 and gave Rayonier the right to harvest certain blocks of timber in the South Moresby area. The company presented a five-year logging plan which proposed to move their contract logging operation (Frank Beban Logging Ltd.) south from Talunkwan Island to Burnaby Island.

The Skidegate Band Council objected to this move on the ground that the Haida people still rely on the area in question for sustenance, as well as artistic, cultural and spiritual inspiration. They felt that the presence of logging on the planned scale would degrade the quality of the land and thus the quality of their lives. The Haida nation has never extinguished aboriginal title to Haada Gwai (the Queen Charlotte Islands). To the Haida it is all Haida Land.

The Islands Protection Committee (later to become the Islands Protection Society [IPS]) was formed in the fall of 1974 to voice the environmental concerns of the general public. Together, the IPS and the Haidas drafted a proposal to preserve all the area south of the Tangil Peninsula as a wilderness area and submitted it to the provincial government for consideration. This proposal came to be known as the South Moresby Wilderness Proposal.

In November 1974 the parties to the conflict met in Skidegate with involved government agencies and members of the provincial cabinet. By December, a decision was made to withhold approval of plans to log Burnaby Island, and the company applied for permission to log in Block 3 on Lyell Island in the northern section of the Wilderness Proposal. Approval of a plan for logging on Lyell Island was granted four months later.

The Growth of Public and Government Interest

In February of 1975 a petition bearing the signatures of 500 Queen Charlotte Islands residents was delivered to the provincial legislature. It requested a moratorium on all logging within the South Moresby Wilderness Proposal area until environmental impact studies could be completed. Concerns were expressed over instances of slope failure and salmon habitat damage elsewhere on the Queen Charlottes and within T.F.L. 24 on Talunkwan Island. As a result, in April of 1975 the Environment and Land Use Committee (ELUC) instructed its Secretariat to prepare an overview study of South Moresby.

The overview study commenced in June 1976. In July, Secretariat staff toured South Moresby and consulted with involved parties and the public. Over the next year studies were conducted by the provincial Parks Branch for park potential; by the B.C. Forest Service for environmental protection area assessment; by the Ministry of Environment and B.C. Provincial Museum for bird, mammal, and freshwater fish inventories; the Ministry of Energy, Mines and Petroleum Resources for assessment of mineral potential; and by the Ecological Reserves Unit for potential ecological reserves (the Unit was organized under the Ministry of Environment at the time and was shifted to the Ministry of Lands, Parks and Housing in 1979).

During the same period, Parks Canada indicated that South Moresby was a "natural area of Canadian significance" and commissioned a study of the area's natural history. South Moresby was being considered, along with other areas on the North Coast, as a potential National Park.

Anthony Island at the south end of the South Moresby area was in the process of nomination as a World Heritage Cultural Site under the World Heritage Convention of the United Nations Education, Scientific and Cultural Organization (UNESCO). When this designation was completed in 1982, Anthony Island was one of only two such sites in Canada. The whole of South Moresby meets several criteria for designation as a World Natural Heritage Site and would complement the Cultural Heritage Site designation for Anthony Island.

In November 1977 the Second All-Islands Symposium was sponsored by the Islands Protection Society and focussed on "Resource Conflict in the South Moresby Wilderness Proposal". Participants included representatives from industry, federal and provincial government agencies, and numerous public interest organizations. The two-day event resulted in a resolution calling for public hearings into the renewal of T.F.L. 24.

The year of 1978 brought increasing attention to the South Moresby area by the media, the general public, and their elected representatives. In January, the Ecological Reserves Unit accepted a proposal to create an ecological reserve in Windy Bay and Dodge Point on Lyell Island. This proposal created further conflicts with the logging activities in T.F.L. 24.

The New FOREST ACT and Legal Proceedings

During the summer of 1978 the new FOREST ACT was debated and adopted amid intensifying calls for public hearings into T.F.L. renewals. As a result of the South Moresby issue, 60 submissions were made to the Minister of Forests in support of replacement hearings for T.F.L. 24, and three submissions were made against. In November, the Member of the Legislative Assembly (MLA) and the Member of Parliament (MP) for the area both called for hearings. When the Minister of Forests did not call for hearings into the replacement of T.F.L. 24, the ingredients were present for a heightened confrontation.

In January 1979 the Islands Protection Society sponsored the petition to the Supreme Court of B.C. of Chief Tanu et. al. vs. Ministry of Forests. The three petitions representing the interests of trappers and hunter-gatherers, cited the JUDICIAL REVIEW PROCEDURES ACT, and claimed that the Minister of Forests had not considered their interests fairly with regards to the pending renewal of T.F.L. 24. The petition was dismissed, primarily on the grounds that the T.F.L. had not yet been renewed.

In May 1979 the Minister renewed T.F.L. 24 for a 25-year period. The petitioners returned to court but the action was dismissed on the grounds that the T.F.L. had been renewed. Finally the petitioners applied for leave to appeal the decision to the Supreme Court of Canada under the sponsorship of the Council of the Haida Nation. This action was also dismissed on the grounds that the JUDICIAL REVIEW PROCEDURES ACT was a provincial law applying only to B.C.

South Moresby Resource Planning Team Established

In March of 1979, the ELUC Secretariat released their overview study. It recommended the establishment of "a five-year multiple land use planning program" to resolve the South Moresby conflict and a two-year study by the same approach of the Windy Bay Ecological Reserve Proposal. The report suggested that the Ministry of Forests act as lead agency to the planning program, and gave some general guidelines regarding membership and terms of reference.

In May of 1979 the Prince Rupert Forest Region of the Ministry of Forests organized the South Moresby Resource Planning Team and scheduled its first meeting to be held on June 12 in Queen Charlotte City. On November 1, 1980 the assets of Rayonier, including the cutting rights to T.F.L. 24, were transferred to a new company, Western Forest Products Ltd. The change of ownership did not affect the representation of the licensee on the planning team.

Conflict and public interest did not diminish with the establishment of the planning team. Logging and mineral exploration continued in South Moresby and several controversies arose, particularly regarding logging on the east side of Lyell Island and the staking of mineral claims in Windy Bay. The Management and Working Plan for T.F.L. 24 and the Timber Supply Area Report for the remainder of South Moresby were presented and subject to public comment. Media interest in the area, and the planning team, remained high and articles appeared in several papers and magazines including MacLeans Magazine and B.C. Outdoors. Films, including a CBC "Nature of Things" documentary, were shot and shown on television and several planning team members were interviewed by the media. The recreational use of South Moresby increased dramatically as tour companies began to operate charter trips into the area. The net result has been continued public interest and correspondence to government ministers and to the planning team.

2.0 THE PLANNING PROCESS

2.1 The Objective

The SMRPT has attempted in its land use planning program to meet the following objectives:

a) to inventory and analyze the resources of South Moresby;
b) to develop a series of land use options;
c) to evaluate the relevant costs and benefits of each land use option;
d) to recommend appropriate action to follow a land use decision by the ELUC.

The organization of this report is based on these four phases of work.

Various programs to assess the resources of South Moresby have been undertaken throughout the life of the project, depending on problem-solving needs. The number of projects were limited by constraints on time and resources available to the team. Information is less than complete in certain subject areas. However, background technical information has been gathered on terrain stability, fish streams, wildlife populations, mineral potential, traditional Haida use, recreational use and landscapes. The team has utilized resource information derived outside the planning process as much as possible. The total available resource inventory and analysis for South Moresby is summarized in Section 3.0.

The four land use options presented in this report were developed through a technical subcommittee appointed to work with boundaries and land use configurations as advised by the team as a whole. This final series is intended to represent the range of interests at stake in South Moresby. The system of zones used to design the options is described in Section 4.0. The resource inventory and analysis has contributed to the definition of management objectives and compatible land uses for each zone.

The evaluation of the four options in Section 5.0 represents a third and critical phase which forms the basis for selection of an option. The evaluation establishes the interactions between differing resource uses in terms of what is achieved as well as foregone with each option. A basic distinction may be made between resources which have no tangible commercial value and those which do. Different criteria have been established for expressing costs and benefits in each case. The commercial resources are timber, mineral, and fisheries. The non-commercial values are those which pertain to the natural environment and ecosystems as a whole, the wilderness and recreation opportunities, and the cultural heritage of South Moresby.

There has been a continuing public response to South Moresby land use issues throughout the project. A record of this response is briefly summarized in Section 6.0. Finally, some basic recommendations for implementing a selected option are discussed in Section 7.0. The continuing activities of resource agencies and the planning team will eventually depend on direction received from the ELUC. However, Section 7.0 indicates some of the outstanding issues and management problems which should be addressed in further planning for South Moresby.

2.2 Public Involvement

Historically, forms of public involvement predate the British system of parliamentary government. The concept that public groups are entitled to be heard prior to decision-making also has long roots in common law. Over the last few decades, public skepticism of institutions has increased. This is particularly true of governments as they have tried to manage more and more complex societies, which have become increasingly diverse. Our society has become more urbanized with widely differing views of government and a higher level of general education. The media surround us with new and probing information. Some political scientists have suggested a tendency of bureaucracies to become "captured" by the industries they were designed to regulate, leading them to protect those industries, rather than the public. As a result of these trends, the public increasingly demands more information, involvement, and responsibility from government for decisions affecting their lives. It was within this milieu that the present planning team was established.

The terms of reference given to the planning team by ELUC were broad and loosely defined, and thus were interpreted to convey a considerable amount of responsibility to the team. As a result, the team has considered it necessary to take a broad view of its duties, and of the support required to carry them out. This consideration was reinforced by the nature and magnitude of the planning problem, a problem among the most complex in the province at the time. Members of the team participated in two provincial workshops on public involvement, one sponsored by the Ministry of Forests when current Ministry policy was in its formative stages. As a result the team repeatedly scrutinized the many forms of public involvement, from official-level consultation, to advisory committees, workshops, presentations, and formalized public hearings. From the point of view of most public members, the concepts of procedural fairness implicit in hearings provided a standard against which to measure the effectiveness of public involvement within the planning team. Considerable time and effort was spent in trying to reach this standard, but it was largely unattainable because of administrative constraints.

In its capacity as lead agency, the Ministry of Forests administered the team through the office of the Regional Manager in Smithers. All funding, all logistical and secretarial support, and all communication with the provincial government was carried on through the Smithers office. Initial chairmanship of the team by a Ministry of Forests representative gave way to the appointment of a public member to this position. Despite the team's responsibility, it had no authority to administer a budget or to seek information directly from government. The planning team was unable to ensure that resource agencies undertook the research and inventory that was required. In addition, there was a prolonged turnaround time between a request for information and a formal response. To many members, this administrative arrangement and its ramifications were inconsistent with the team's responsibility as set out in its terms of reference.

The "public" is usually considered to be those persons outside of government. Some believe that the electoral process does not provide an adequate mechanism to represent their views to government. They feel that only direct and detailed representations adequately relate their specific interests. These interests may be non-economic as well as economic. The public, must be seen not as a homogenous mass, but as groups with overlapping, often conflicting, special interests. Many of these interests, particularly the non-economic ones, are either unrepresented or presented by financially weak organizations. Natural resources which are owned by everybody, are rarely well-represented by the public relative to the interest at stake. A crucial aspect of public involvement is affording a rough equality to mismatched adversaries. When the mismatch is economic, the anomaly is often corrected by providing funding or other assistance. Such was not the case with the South Moresby Resource Planning Team.

As lead agency, the Forest Service eventually appointed the following non-government public members to the team. Each served without pay or reimbursement of expenses through some 500 hours of meetings over the last four years; many incurred uncompensated costs in order to attend:

> Western Forest Products: the major tree farm licence holder in South Moresby.
>
> Island Protection Society: the originators of the South Moresby Wilderness Proposal.
>
> Skidegate Band Council: representing the Haida interests without prejudice to their "claim" of jurisdiction and ownership.
>
> Q.C.I. Museum: representing the views of heritage site professionals generally, and its own interests.
>
> Public Representative: appointed to provide continuity from the Public Advisory Committee, and address concerns at large.

In order to interpret a wide spectrum of concerns and perspectives, each team member was called upon to broaden his own constituency base to accommodate any new ideas that might be introduced. It was felt that the criterion for adding members should rest upon their bringing in new information or positive assistance in planning rather than more weight to one concern over another. A trial observer status was granted to the B.C. and Yukon Chamber of Mines and the Moresby Island Advisory Planning Committee which generated some assistance. Several briefs were received from non-members, but the majority of the concerns presented had already been considered by the membership.

Periodically, meeting procedures became sources of concern. A modified parliamentary procedure was adopted and administered by the Chairman. Voting methods were revised to require greater concensus before motions were carried. Motions were tempered to accommodate divergent views, but despite these and other efforts to incorporate minority views directly into the team's work, the process was often frustrating.

It was evident from the outset that members were not content to concentrate their efforts entirely on the planning team. It was clear that many would continue to lobby government and make use of the media to influence opinion. With the exception of a few meetings that were closed to the press to dissuade posturing, all meetings were public and open. Media coverage has been inconsistent, due to the often technical nature of the proceedings, but press releases have been regularly issued. Team members have also written to the press on occasion. Appeals for public opinions were made by the Chairman and public representative on numerous occasions. As well, some media coverage solicited public responses. Thus a variety of letters voicing public opinion were received by the team either directly or through various Ministries. These forms of public input have been summarized in Section 6.0.

2.3 Comparing Economic and Non-Economic Values

As detailed in the Windy Bay Report, the team has concluded that there is at present no satisfactory analytical model for the comparison of economic and non-economic values. While there have been many attempts in the literature to come to grips with this problem, none seemed readily applicable. Although the temptation to "develop a new science" capable of doing so was recognized, the work has simply been beyond the means available to the planning team.

At the time of this report no systemic model of the economy of B.C. existed although work is proceeding towards this goal by provincial economists. A systemic model of non-economic values would probably require an even greater effort to construct and test, and thus we must reluctantly submit this report using largely non-comparable estimations of value for the resources under discussion.

The team is also concerned that traditional economic measures of value may be easily and widely misinterpreted. Although the shortcomings and limitations of figures quoted are well known to economists, they are often seen as more reliable than they warrant. It should be recognized that as useful as economic models may be, they represent gross oversimplifications of the real world. In many cases, the predictions of these models are completely overshadowed by outside events, such as a general recession, a poor market for products, labor-management disputes, changing technologies, and changing public demands.

Thus all economic measures quoted in this report should be prefaced with a statement like, "the present value attributable to logging or tourism in South Moresby is ..." Projections far into the future are speculative. Net losses to the province in values or employment rests largely upon the assumption that the capital involved cannot be productively reinvested elsewhere in the province. Clearly, it is easier to retain capital in an established profitable industry than it is to look for an untapped investment elsewhere in the province. The magnitude of projected losses in employment are nonetheless arguable, and losses in employment may not equate with losses in jobs. Furthermore, foregoing immediate economic benefits does not mean that those benefits will be permanently lost. Rather, they may be considered to be deferred for further generations to decide upon.

Non-economic values should not be overlooked. Subsistence constitutes a tangible but unquantified value. Even further from human economic values is the belief that something should be allowed to exist in its own right and for its own sake. This belief is a key aspect of wilderness.

The notions of option and existence value, not addressed elsewhere in this report, should be considered. Option value is the value placed on a non-economic resource by a person who has no immediate plans to utilize it directly. It is the value of knowing something will be there should he, or someone else, need it. Existence value is simply the value to an individual of knowing that a particular thing continues to exist. Either may represent values that provide a philosophical reason for being. In that sense, they can be likened to religious values in that they may give meaning and purpose to life.

2.4 Mineral Claim Staking

Mineral development activity in South Moresby has fluctuated over the past 100 years. Interest since the 1950's has focussed on iron-copper desposits. This culminated in the mining of Jedway in the mid-1960's. More recently, with the discovery of the Cinola gold deposit on Graham Island, exploration has concentrated on a search for gold desposits.

At the beginning of the planning process in 1979 there were five active mineral claims in the area. In the winter of 1979-80, the exploration of the Cinola (Babe) prospect led to a flurry of mineral claim staking throughout the Queen Charlottes. Areas of geological composition resembling Cinola were comprehensively staked in South Moresby.

Exploration associated with these recent claims is at a relatively early stage, comprised mainly of soil sampling and geochemical investigation. A limited amount of exploratory drilling and trenching has occurred, and some claim staking continues. At present, virtually the entire South Moresby (excluding the Hotsprings-De La Beche Mineral Reserve) is available for mineral exploration.

Early in the planning process the team requested a temporary reserve from claim staking in South Moresby. The intention was to ensure the viability of whatever land use recommendations would be forthcoming. The Ministry of Energy, Mines and Petroleum Resources (MEMPR) view this as a permanent alienation of the area from mineral interests and denied the request. As a compromise, the team next determined those areas inventoried by MEMPR as having low mineral potential. A request for a temporary reserve over these areas was also not successful. With the exception of temporary reserves over selected areas of the Windy Bay Ecological Reserve Proposal, all requests to reserve areas of extremely high recreational sensitivity were denied. Many of the areas requested for temporary reserve status were subsequently staked and explored.

The MEMPR's rationale for its refusal of mineral reserve requests stems from the fact that subsurface mineral resources are difficult to inventory in the manner of other resources. As the exploration process can be costly, the primary source of mineral resource inventory in B.C. is the economically motivated efforts of the private mining sector. Therefore, data would not be gathered without continued exploration. MEMPR maintained that it would not support planning team recommendations without a substantially improved resource inventory.

While this reasoning may be understandably appropriate to the specific interests of MEMPR, it is considered inconsistent with the approach taken by other members on the planning team and with the larger perspective of the team's mandate outlined by the ELUC. That mandate envisions withdrawals from forest industry tenures to protect wilderness values in South Moresby. While it might seem obvious that mining, particularly open pit mining, is likewise incompatible with a natural area, the MEMPR does not hold this view, and has exercised a priority of interest in the area.

Some of these difficulties might possibly have been avoided in the drafting of the team's terms of reference, if the special requirements of MEMPR and indeed the planning process has been given more thorough consideration.

3.0 RESOURCES OF SOUTH MORESBY

3.1 The Natural Environment

3.1.1 PHYSIOGRAPHY AND GEOLOGY

The Queen Charlotte Islands have had a complex geological history. It is now generally accepted by geoscientists that the islands, along with Vancouver Island and the adjacent lower coast of British Columbia, known together as the Wrangellia Terrane, originated further to the south but were shifted northwards along major fault systems to their present position about 140 million years ago. Since that time several periods of volcanic and intrusive igneous activity were interspersed with quiet periods of marine and non-marine sedimentation in small and major basins. An almost complete stratigraphic succession of rocks ranging from Late Triassic (210 million years ago) to Recent (10,000 years ago) are exposed in South Moresby. Three major northwest-southeast trending fault systems traverse the length of the Queen Charlottes and during intermittent periods of activity have played a major role in distribution of rock types and subsequent development of physiographic features. Present day seismic activity is related to these fault systems. Bulletin No. 54, Geology of the Queen Charlotte Islands by Dr. A. Sutherland Brown of the B.C. Department of Mines, provides a detailed account of the geology and mineral deposits of the islands.

South Moresby lies entirely within the Queen Charlotte Ranges physiographic subdivision of the Queen Charlotte Mountains (Holland, 1976). The San Christoval Range forms a steeply rising, prominent linear range on the west side of central Moresby Island from Tasu Sound south to Gowgaia Bay. Elevations range to over 1200 metres with a general decline in maximum heights towards Cape St. James.

The west coast of Moresby Island is an abrupt, straight fault-line scarp that essentially forms part of the continental shelf edge. Regularity of this coast along with the steepness of the adjacent land mass contribute to the extremely dynamic coastal marine environment. By contrast, the east coast of Moresby Island has a gentler slope and is punctuated by numerous inlets and bays with dozens of smaller offshore islands. Shoreline areas tend to be steep and rocky with few well developed estuarine areas. Exceptions occur in protected waters at the heads of inlets.

The physiography of the sea bed adjacent to the archipelago consists of high relief intertidal areas. Nearshore depths vary from 100 to 400 metres. Shoals occur within 80 metres of the surface. These shallow areas are important for the salmon fishery.

The Queen Charlotte Islands were intensively glaciated during the Pleistocene. Evidence of the last period of glaciation which ended about 10,000 years ago, is varied and widespread. Major valleys are characteristically U-shaped, while peaks above 1,000 metres were extensively sculptured by cirque glaciers to produce serrated and matterhorn shapes. Glacial erosion extended below sea level along both coasts of the planning area. Glacial features such as striae, erratics, drumlins and fluting, and glacial deposits consisting of till, marine drift, stony clays and outwash sands are found throughout the islands.

3.1.2 CLIMATE

Weather patterns in South Moresby are influenced by a combination of factors. Generally, October is the wettest month, followed by a gradual steady decrease from November to June. From October to December, storms are most intense with rainfall approaching 80 to 100 mm in 24 hours, and winds often exceeding 100 km per hour. This is a result of the North Pacific High slipping southward far enough so the path of frontal systems generated in the Aleutian Low passes directly over the Islands. The driest months are May, June and July when the Pacific High affords the greatest protection from storm systems. Summer precipitation during this period will vary from 200 mm at Cape St. James to over 600 mm at Lockeport (Lewis, 1982). This variation is largely due to a mountainous topography, with the west coast and mid-island areas receiving the greatest annual and most intense rainfall. The rainy season then begins rather abruptly from mid-August to September, gradually rising to the October maximum.

Air temperatures are characterized by an absence of extremes resulting from the strong moderating effect of the Pacific. Climate station data indicate a slightly greater temperature range at leeward, east-coast stations than on the exposed, west-coast stations. Mean annual temperatures for tidewater stations range from $7.6^{\circ}C$ to $8.2^{\circ}C$ (Lewis, 1982).

3.1.3 VEGETATION

The vegetation of South Moresby is a complex of maritime, lowland forest, muskeg and montane plant communities (Foster and Pojar, 1977). The old-growth climax forests which predominate are similar to the closed coniferous forests found along coastal B.C. and southeast Alaska. However, the absence of either amabilis fir or Douglas fir, and the widespread occurrence of Sitka spruce, distinguishes South Moresby forests and Queen Charlotte Island forests in general from those elsewhere on the coast. Western hemlock, Sitka spruce and western red cedar dominate in lower elevation stands, while mountain hemlock and yellow cedar become increasingly numerous with elevation. The development of these forests is influenced by active geomorphic processes such as repeated erosion and soil movement, and by frequent gale-force winds resulting in windthrow. Along the exposed rocky coast vegetation types reflect the influence of salt spray and fog.

Biogeoclimatic Classification

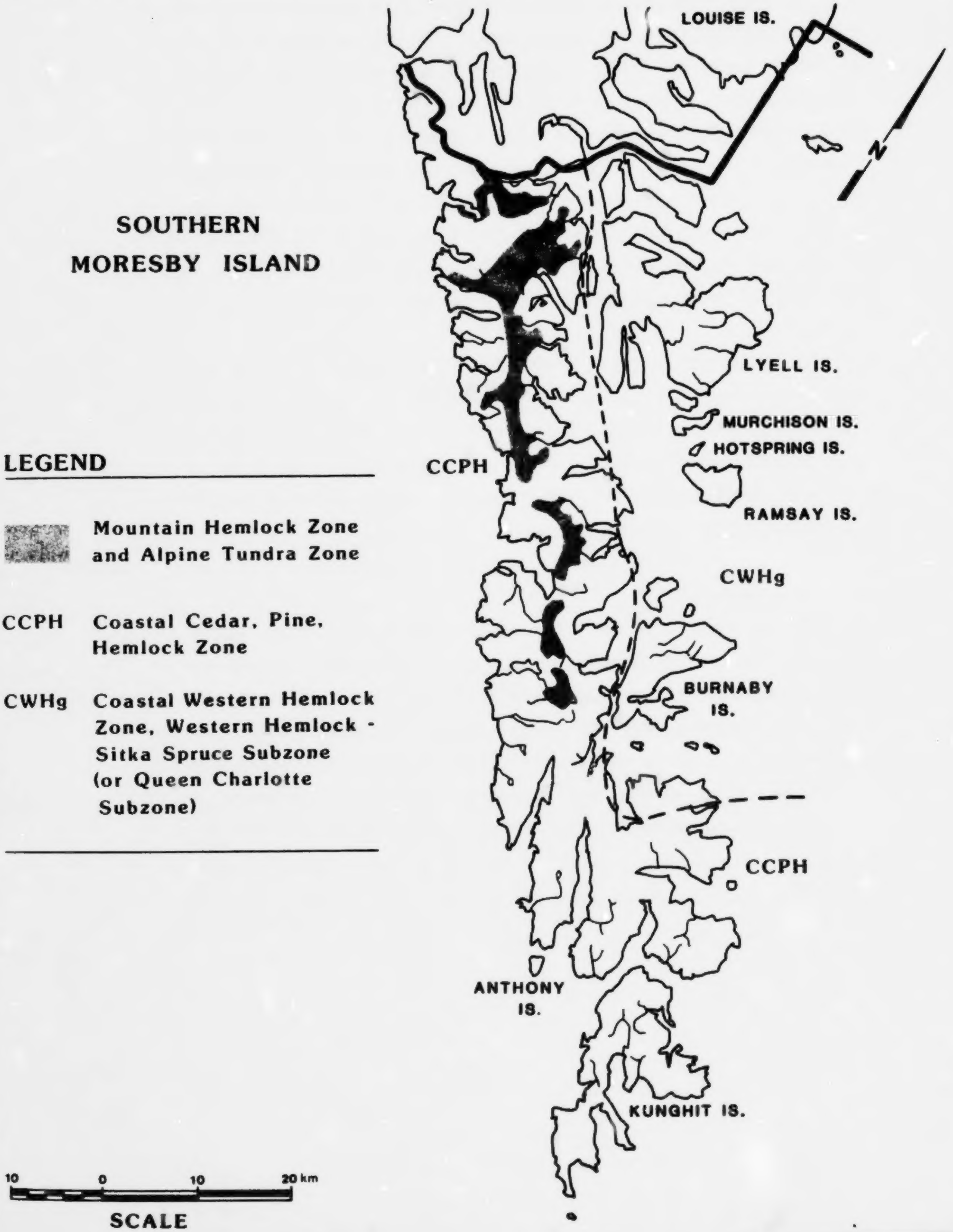
The four biogeoclimatic zones in South Moresby are illustrated in Figure 4 (Banner et. al., 1983). The Coastal Western Hemlock Zone (CWH) is represented by the drier Queen Charlotte Islands subzone (CWHg) on the smaller east coast islands and the extreme eastern edge of Moresby Island. Jedway is the approximate southern limit of the CWHg. The major tree species of the subzone are western hemlock, western red cedar, Sitka spruce and yellow cedar.

The most productive forest communities within the CWHg occur on recently deposited alluvial materials adjacent to streams and rivers. These alluvial 'meadow forests' are characterized by large, tall, widely spaced Sitka spruce. Vigorous spruce-hemlock mixtures occur from the middle to the bottom of steep, freely drained slopes. At higher elevations similar forests occur with a yellow cedar component. The few dry forested habitats of the CWHg are found in South Moresby ridgetops and upperslopes of the northeastern corner, such as on Lyell Island. Western red cedar dominates the climax forests in these habitats and shore pine may occur on excessively dry sites.

Climax forest ecosystems in the CWHg have been dramatically affected by the black-tailed deer population over the last 40 years, resulting in sparse herb and shrub layers. Lewis (1982) noted that the majority of woody shrubs, ferns and large vascular plants had been reduced. In addition, red cedar regeneration has been seriously depleted and sometimes eliminated in many mature forests, particularly on productive sites.

The maritime communities which occur in the CWHg are also characteristic of South Moresby and reflect the influence of tidal action and saltspray. The major forested seacoast ecosystem is represented by the less vigorous spruce-reedgrass forests on rocky marine headlands. Common non-forested plant communities are shingle beaches at the head of inlets and along the margins of protected bays, rock and cliff communities, salt water marshes and mud flats. A complete description of maritime communities is provided in Calder and Taylor (1968).

Figure 4 BIOGEOCLIMATIC ZONES OF SOUTH MORESBY ISLAND


SOUTHERN
MORESBY ISLAND
LEGEND
▨ Mountain Hemlock Zone and Alpine Tundra Zone
CCPH Coastal Cedar, Pine, Hemlock Zone
CWHg Coastal Western Hemlock Zone, Western Hemlock - Sitka Spruce Subzone (or Queen Charlotte Subzone)
10
0
10
20 km
SCALE
LOUISE IS.
N
LYELL IS.
MURCHISON IS.
HOTSPRING IS.
RAMSAY IS.
CCPH
CWHg
BURNABY IS.
CCPH
ANTHONY IS.
KUNGHIT IS.

The Coastal Cedars Pine Hemlock Zone (CCPH) is the second major zone in South Moresby, situated to the west and south of the CWHg. The vegetation of the CCPH is influenced by the greater amount of precipitation and humidity relative to the CWHg. Much of the landscape of the CCPH is covered with blanket bog, normally found on undulating rocky terrain along the west flanks of the Queen Charlotte Ranges. Characteristic forests are scrubby, "bonsai" mixtures of red and yellow cedar, western and mountain hemlock, and shore pine, which reflect the strong and persistent westerly winds sweeping in from the adjacent ocean (Calder and Taylor, 1968). The productive forests of the CCPH are restricted to the rapidly drained steep colluvial slopes and alluvial valley bottoms.

The Mountain Hemlock Zone (MH) occurs at elevations above the CWHg and CCPH, starting at 550-600 m. This zone may be distinguished by the dominance of mountain hemlock in open forest with short, tapered trees. Yellow cedar is often found in association with mountain hemlock. The treeless Alpine Tundra Zone (AT) is found at higher elevations.

Plant Geography

For the most part the flora of the Queen Charlotte Islands, and therefore South Moresby, consists of relatively common species typical of the north coastal district of North America (Banner et. al., 1983). However, there are several groups of species which are unique for various reasons and are therefore of scientific interest. Certain flora, mostly mosses and freshwater algae, are considered to be endemic or highly disjunct by virtue of their relation to species from unglaciated areas elsewhere in the world. The endemic taxa provide part of the evidence for glacial refugia on the Islands, as discussed in Section 3.1.6. A second group of very limited occurrence appears to be relics of a northward migration preceeding the post-glacial warm, dry Hypsithermal period.

In general, floristic diversity on the Islands is greatest in montane habitats close to the highest ranges north of the study area boundary, and decreases toward the south. There are three species whose range on the islands is exclusive to South Moresby. These are confined to isolated locations on Kunghit Island and probably represent the northern range for these species (Calder and Taylor, 1968).

3.1.4 WILDLIFE

Birdlife

The most outstanding feature of South Moresby wildlife is its abundant birdlife. The area supports a wide variety and large populations of seabirds, waterfowl, raptors, forest and alpine birds. There are well over 100 species in all.

Seabirds

South Moresby provides nesting habitat for over 250,000 breeding pairs, about 25 percent of the total provincial seabird population. According to the census data compiled by Campbell and Garrioch (1979), this includes two-thirds of the tufted puffins, half of the Cassin's auklets, three-quarters of the ancient murrelets, and one-third of the storm petrels which nest in B.C. Horned puffins are also found in South Moresby, one of the few places in Canada where this species can be seen. The common murre colony is one of only two in B.C.

The locations and populations of active seabird colonies are shown in Figure 5 and its accompanying Table 1.

A great many of the seabirds of South Moresby are burrow nesters including the rhinocerous and Cassin's auklets, the ancient murrelets, tufted puffins, pigeon guillemots, and both the fork-tailed and the Leach's storm petrels. Most of the birds are seldom seen near land except when they come ashore to breed during the late spring and summer. At this time they congregate in colonies of up to 40,000 pairs on isolated islets and forested slopes of larger islands. The nests are created by burrowing through the soil beneath tree roots, grassy hummocks, or rocks to a depth of one metre.

Adult birds take turns incubating a single egg while the mate flies far offshore to feed. Each evening at dusk the feeders return and stage in large numbers just offshore before the last leg home to the nest. It is at this time that they are extremely vulnerable to predation by raptors such as the Peale's peregrine falcon, bald eagle and raven. After the young hatch, this nightly ritual continues as the adults return with food for the chick. The chick is ready to leave the burrow at about six weeks of age.

Murrelets differ somewhat from the other burrow nesters in their nesting strategies. The ancient murrelet, which nests only in old-growth forests, does not feed its young in the burrow. When the downy chick is only two days old it follows its parents out of the burrow and down steep hillsides into the ocean where, under cover of darkness, it swims far out to sea.

The marbled murrelet also occurs in abundance in South Moresby. They are often seen in pairs and groups on nearshore waters throughout spring and summer, yet their nesting habits remain a mystery. They are thought to nest high up in the mossy branches of mature forest, several kilometres inland.

Pelagic cormorants nest at several locations in South Moresby: usually in small colonies on rocky cliff ledges or in sea caves. Common murres are also cliff nesters and are found in one colony near Cape St. James. A few horned puffins nest near Anthony Island. Glaucous winged gulls, the only species of gull to nest on the Queen Charlottes, occur in small colonies on many small, treeless islets throughout South Moresby.

Waterfowl and Shorebirds

The shorelines and estuaries of the South Moresby area harbour wintering and migrating waterfowl such as loons, geese, swans, sandhill cranes and many duck species. In the fall and spring, flocks numbering in the thousands may be seen in many of the locations shown in Figure 5. Various ducks can be seen throughout the summer.

The albatross, shearwater, fulmar, and other pelagic birds also occur, but are usually not recorded in shoreline surveys and are not included in Table 1. Also not included in Table 1 are the many species of shorebirds, such as dunlins, sandpipers, and turnstones. Shorebirds occur in varying numbers depending on seasonal migrations.

Figure 5 BIRD COLONIES AND AGGREGATIONS

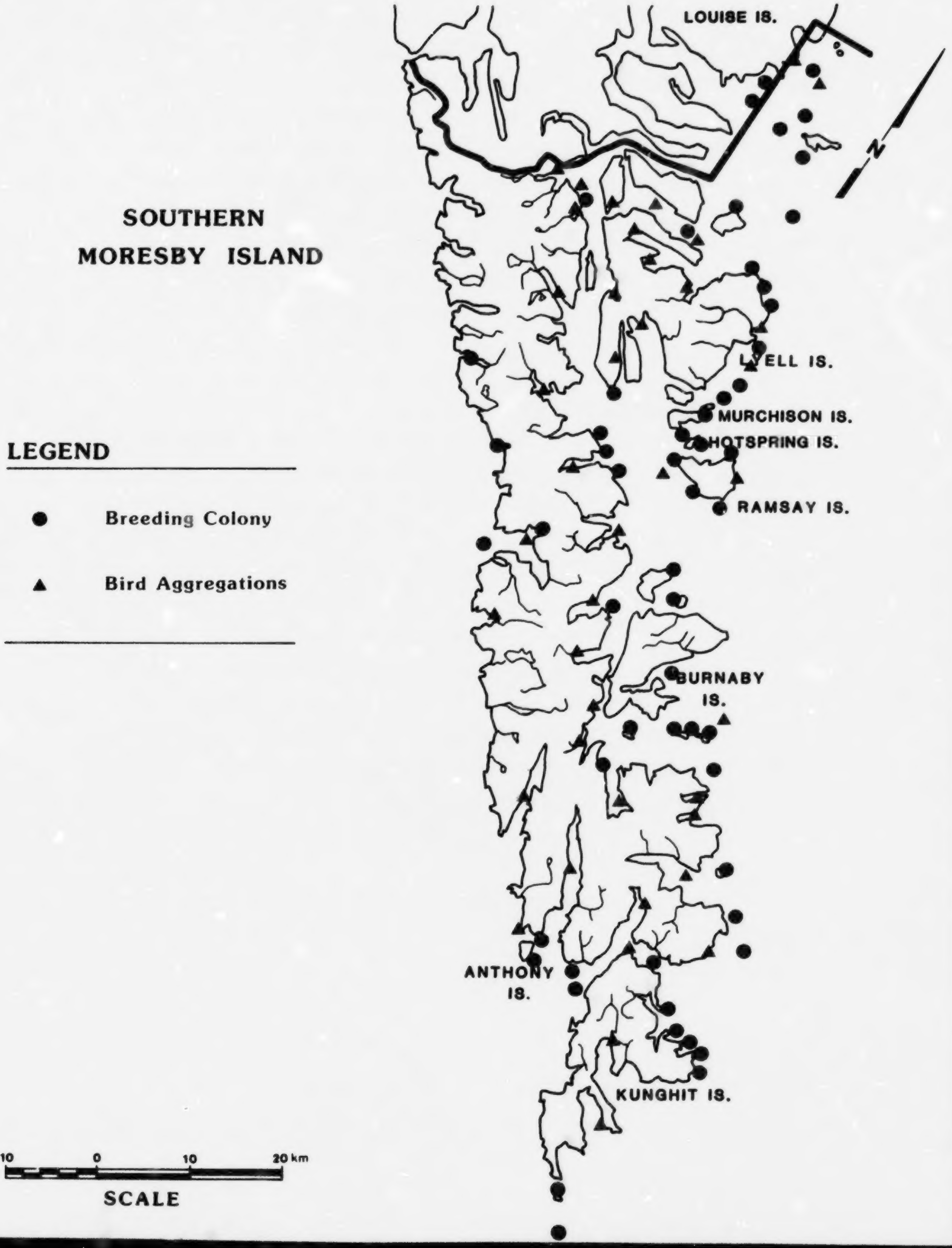

SOUTHERN
MORESBY ISLAND
LEGEND
● Breeding Colony
▲ Bird Aggregations
LOUISE IS.
N
LYELL IS.
MURCHISON IS.
HOTSPRING IS.
RAMSAY IS.
BURNABY IS.
ANTHONY IS.
KUNGHIT IS.
10
0
10
20 km
SCALE

Table 1 SEABIRD COLONIES

	BREEDING COLONY	Fork-Tailed Storm Petrel	Leach's Storm Petrel	Pigeon Guillemot	Ancient Murrelet	Cassin's Auklet	Rhinoceros Auklet	Tufted Puffin	Pelagic Cormorant	Glaucous-Winged Gull	Common Murre	TOTAL BREEDING PAIRS
	EAST COAST, MORESBY ISLAND											
1	Skedans Islands	10,000				500				35		10,535
2	Low Island	S		15+		S				70		85+
3	**Limestone Islands**			50	15,000	[illegible]						15,080
4	**Vertical Point**								25			25
5	South Low Island									20		20
6	Reef Island			10+	500+	500+	100		45	9		1,164+
7	**Kingsway Rock**			9						70		79
8	**Lost Island**	100+		48		40				45		233+
9	Titul Island			10		200+						210+
10	Gil Islet			10+								10+
11	**Kul Rocks**			1+						11		12+
12	**Dodge Point to Fuller Point**				60,000							60,000
13	Tar Islets	15	15			100				24		164
14	Kawas Islets	300		15+		250				24		589+
15	**Agglomerate Island**	S	1,000+		2,000+					21		3,021+
16	**House Island**			5+	5,000+	50+						5,055+
17	Ramsay Island (Andrew Point)			20	1,000	7,500			20	24		8,564
18	Ramsay Island (Crombie Point)			21						20		41
19	**Tatsung Rock**			6+						43		49+
20	**Ramsay Rock**									14		14
21	Hotspring Islands	100		50		500						650
22	Murchison Islands			14+	800+	200+			75	6		1,095+
23	**Bischof Islands**	5,000		10+	300							5,310+
24	**Hoskins Islets**	2,000		5+								2,005+
25	Hutton Islands			10								10
26	Marco Rock									24		24
27	**Arichika Islands**	500	25+	8	500+	500						1,533+
28	**Centre Island**			15+								15+
29	Alder Island	10		12+	5,500	1,600						7,122+
30	Howay Island				15+	200			20+	5		240+
31	**East Copper Island**	1,000	500		4,500	4,700						10,700
32	**Jeffrey Island**			6	600+	2,000						2,606+
33	George Island		1,500		7,500	750						9,750
34	Skincuttle Island		500+		500							1,000+
35	**Rock Islet**	3,000	3,000			25				1		6,026
36	**Slug Islet**			3	10+					54		67+
37	Bolkus Islands	125+	500		4,500+	1,200+	100			2		6,427+
38	Green Rock			10						7		17
39	**Sea Pigeon Island**			15+	5+							20+
40	**Joyce Rocks**									94		94
41	Rankine Islands	3,500	7,500	25+	11,000+	5,000				6		27,031+
42	Langtry Island	4,000		15		200						4,215
43	**Garcin Rocks**			4+						102		106
44	**Rose Harbour Islets**			25+		50						75+
45	Charles Islets			17		76+						93+
46	High Island				100		100+					200+
47	**Raley Island**									23		23
48	**Jenkins Point (Kunghit)**				1,500							1,500
49	Gull-Marshall Islands			20						1		21
50	Lyman Point Islet							25				25
	SUBTOTAL - EAST COAST:	**29,650+**	**14,540+**	**461+**	[illegible]	[illegible]	[illegible]	**25**	**185+**	**758**		**190,910+**
	WEST COAST, MORESBY ISLAND											
51	Kerouard Islands			25+		22,000		1,500+	10	74	50	23,659+
52	St. James Island					20+		1,500	30	31		1,581+
53	**Gordon Islands**			23		2,000	300	100		6		2,429
54	**Flatrock Island**			12+				4	5	140		161+
55	Anthony Island & adjacent islands	400	6,400	150	200	25,000	2,700	60	11	247		35,168
56	Adam Rocks			4+				6		45		55+
57	**Gowing Islands**			10						21		31
58	**Ocesi Bay (unnamed islets)**			5 S						1		6
59	Mike Inlet & Gowgaia Bay (unnamed islet between)									6		6
60	Mike Inlet									5+		5+
	SUBTOTAL - WEST COAST:	**400**	**6,400**	**229+**	**200**	[illegible]	[illegible]	**3,170+**	**56**	**576+**	**50**	**64,101+**
	TOTAL BREEDING PAIRS:	**30,050+**	**20,940+**	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	**241+**	[illegible]	**50**	**255,011+**

S - Breeding suspected
+ - Numbers greater than recorded

NOTE: The numbers in this table are estimates based on an inventory compiled in 1977, and require updating for several colonies. The Reef Island colony is now believed to be considerably larger, while the Dodge Point colony is probably smaller than reported, or approximately 10,000 pairs.

Raptors

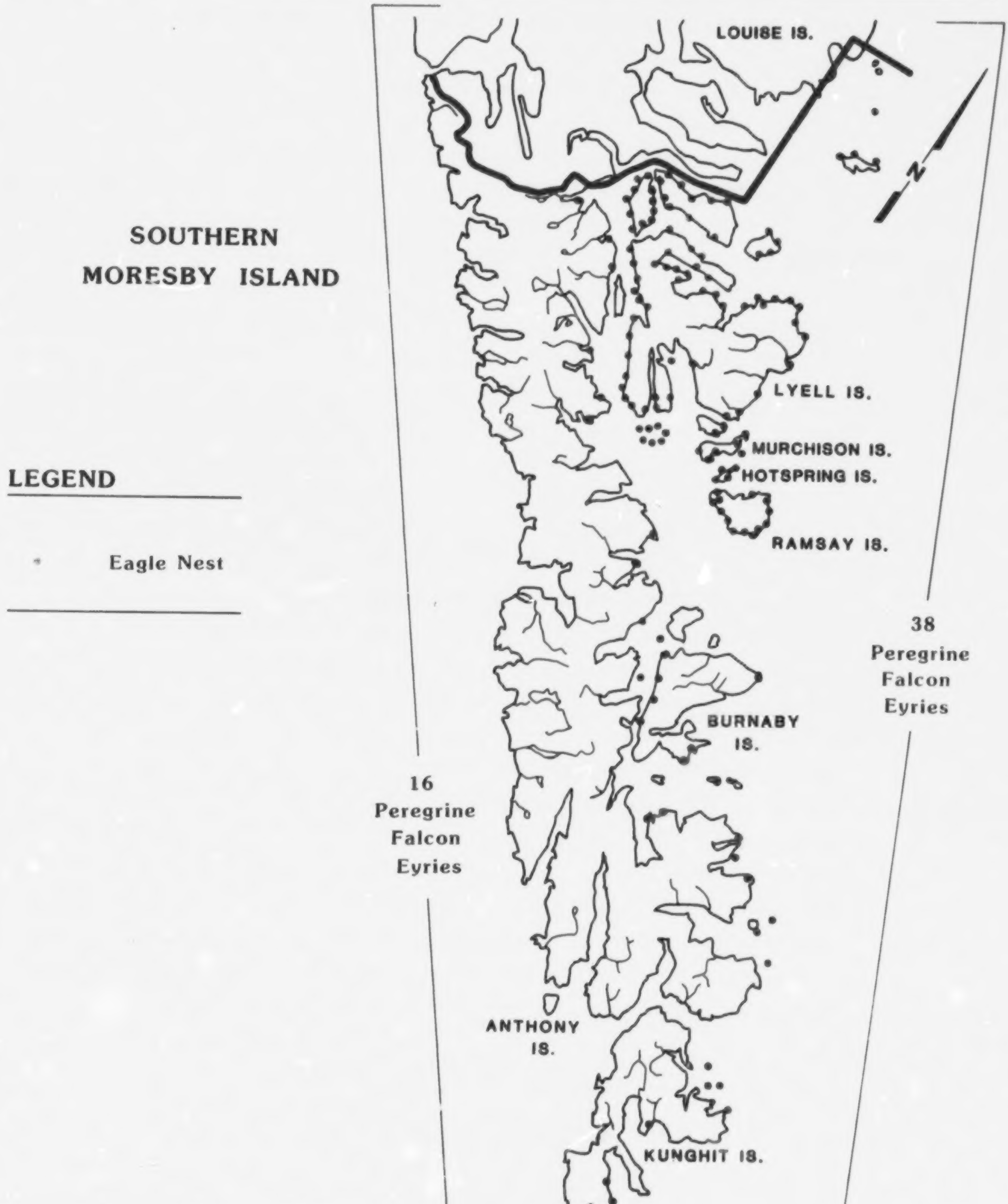
South Moresby is an extremely important area for the rare Peale's peregrine falcon, the largest and fastest subspecies of peregrine. At least 63 eyrie sites are known (Figure 6), but not all of these sites are active every year. The total known population of peregrines in South Moresby is about 75 birds, one-third of the total B.C. population. This relatively large concentration is sustained by the abundance of seabirds available for predation. The Aleutian Islands in Alaska are the only other location in the world where significant concentrations of this race of peregrine falcon are found.

Bald eagles are also numerous in South Moresby and nest throughout the whole area. Like the falcons, the large eagle population is sustained by the large numbers of birds and abundant marine life available for predation. Only one intensive eagle nest survey has been conducted in the area, limited to the vicinity of Lyell and Ramsey Islands (Figure 6). Incidental sightings have been recorded on other parts of the east coast. One-hundred-forty nests have been recorded. Nesting densities in several areas of South Moresby are very high. The west coast of Moresby Island remains completely unsurveyed for eagle nests. The sharp-shinned hawk, northern harrier, Cooper's hawk, goshawk and red-tailed hawk also occur in South Moresby.

Upland Birds

Songbirds including thrushes, warblers, sparrows, chickadees, kinglets and hummingbirds are common throughout the area. Blue grouse occur in the alpine along the San Christoval mountains.

Figure 6 EAGLE AND FALCON NESTING SITES


SOUTHERN MORESBY ISLAND
LEGEND
• Eagle Nest
LOUISE IS.
N
LYELL IS.
MURCHISON IS.
HOTSPRING IS.
RAMSAY IS.
38 Peregrine Falcon Eyries
BURNABY IS.
16 Peregrine Falcon Eyries
ANTHONY IS.
KUNGHIT IS.
10 0 10 20 km
SCALE

Several subspecies of birds occurring in the South Moresby upland are endemic to the Queen Charlotte Islands. These include subspecies of northern saw-whet owl, Steller's jay and hairy woodpecker. These subspecies are of scientific interest for reasons explained in Section 3.1.6.

The remarkable abundance and diversity of birdlife in South Moresby is a major wildlife resource of both provincial and national significance. Seabirds and raptors have attracted the attention of biologists and naturalists for many years. The importance of this resource has been recognized by the establishment of several ecological reserves in the area. The reserves provide opportunities for scientific research and education as well as protection of the fragile nesting terrain from human disruption. Ecological reserves have been established in South Moresby at Rankine, Kerouard, East Copper and Anthony Islands. Three other reserves are presently proposed, including one at Windy Bay/Dodge Point on Lyell Island.

Marine Mammals

Marine mammals frequenting the South Moresby area include whales, sea lions, seals, porpoises and dolphins. Known whale migration routes, fur seal routes, and the locations of the sea lion rookery and haulouts are illustrated in Figure 7.

At least 10 whale species are known in South Moresby. Various whales are sighted regularly but little is known about their numbers or utilization of the area. Killer whales are seen irregularly throughout the year in numbers ranging from two or three to large pods of 35. At least three distinct pods of killer whales have been sighted in South Moresby and appear indigenous to the area. Photographic records indicate that they are distinct from the pods found on the east side of Hecate Strait and off northern Vancouver Island.

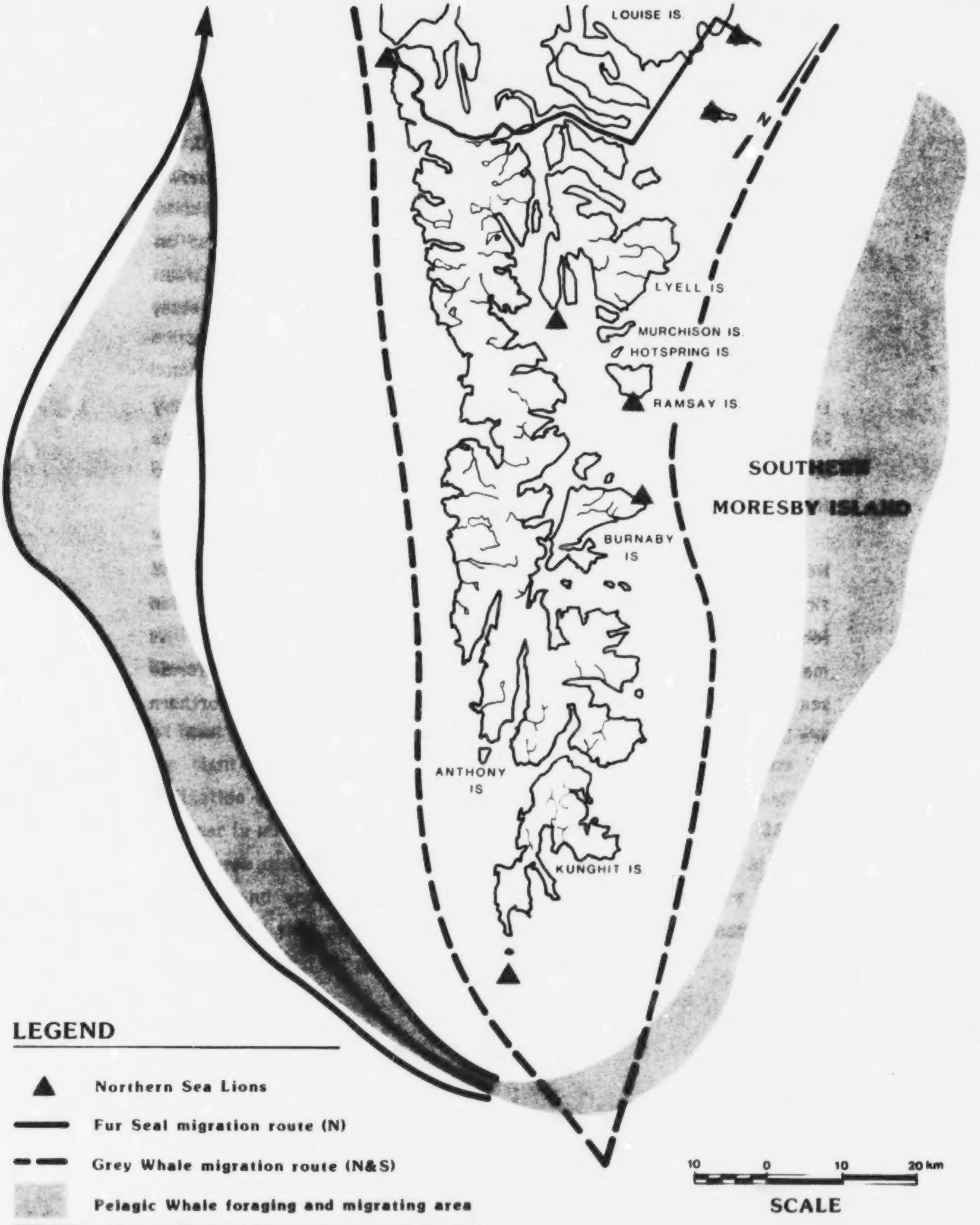
Minke and finback whales are considered common, as is the grey whale which may be seen during its migration up the east and west coasts of Moresby Island. Humpback whales are sighted periodically.

Other whales - sperm, sei, blue, right, and goose-beaked - are now considered rare, and information on them is very poor. A goose-beaked whale was found washed up on Lyell Island in 1980. A few years ago these whales were more numerous and more was known about their distribution. The only historical information is found in records of the whaling station which operated at Rose Harbour on Kunghit Island between 1910 and 1943. In the 18-year period between 1926 and 1943 this station processed approximately 2,000 sperm, blue, fin, humpback and sei whales which were caught in adjacent waters.

Dall and harbour porpoises are common on both coasts of Moresby Island, regularly seen in groups of up to 50 individuals. Several species of dolphin, including the white-sided dolphin, also occur and the rare Risso dolphin has been sighted.

Northern sea lions frequent South Moresby both at the rookery and the six haulout sites shown in Figure 7. The Kerouard Island sea lion rookery is the largest known in B.C., with up to 1,100 animals. As many as 400 sea lions can be seen around Skedans Island. California sea lions are occasionally sighted, usually in the company of Northern sea lions.

Figure 7 MARINE MAMMALS


LOUISE IS.
N
LYELL IS.
MURCHISON IS.
HOTSPRING IS.
RAMSAY IS.
SOUTHERN
MORESBY ISLAND
BURNABY IS
ANTHONY IS
KUNGHIT IS
LEGEND
▲ Northern Sea Lions
Fur Seal migration route (N)
Grey Whale migration route (N&S)
Pelagic Whale foraging and migrating area
10
0
10
20 km
SCALE

Harbour seals are abundant throughout the area and can be found in large numbers on numerous small rocky islands in South Moresby. In the fall, they occupy virtually every stream in South Moresby to feed on salmon. The northern fur seal migrates through the area in the spring and fall. Elephant seals are rare and are encountered irregularly. Most sightings are of single individuals in open water.

The sea otter, once native to the area, is presently extremely rare. There are very occasional sightings on the west coast of Moresby Island. A proposal to reintroduce sea otters to this coast is being considered.

Land Mammals

The Queen Charlotte Islands are the most isolated islands in Canada. Only six species of native land mammals occur here and all of these have subspecies which are endemic to the Queen Charlottes, all of which occur in South Moresby. These native land mammals include black bear, marten, river otter, short-tailed weasel, wandering shrew and deer mouse. A seventh native land mammal, the Dawson caribou, was also endemic to the Charlottes but it is now extinct. It is not known whether or not it inhabited South Moresby. In addition, two native species of bat occur in the area, neither of which is endemic. Several species including the red squirrel, black rat, Norway rat, raccoon, and black-tailed deer have been introduced to the South Moresby area.

The fact that all native land mammals are distinct sub-species occurring only in the Queen Charlottes and the fact that several animals occurring on the adjacent mainland do not occur in the Charlottes has led to considerable scientific investigation and speculation about the possible causes of this high degree of endemism. It is one of the reasons the Islands are referred to as the "Canadian Galapagos". The occurrence of endemic species is discussed further in Section 3.1.6.

The Queen Charlotte black bear, the largest known black bear in Canada, is distinguished by its large skull and teeth. It appears to range widely on South Moresby Island and is often seen foraging on beaches. In the fall it appears along the many salmon streams. Black bears are also seen on some of the small offshore islands but with much less frequency, and primarily in the late summer and fall. There is no adequate inventory of their number.

The Queen Charlotte marten is also distinguished from other sub-species of marten by its larger size. It is of a lighter colour and has a distinctive bright orange patch on its underfur. It appears to be widely distributed on South Moresby Island but is not known to occur on the smaller off-shore islands.

The river otter is also common in South Moresby and is widely distributed on the small off-shore islands. It forages along the shorelines and in the ocean and otter slides can be seen along rocky shorelines.

The short-tailed weasel, the smallest sub-species of weasel, is rare. The extent of its distribution in South Moresby is not known.

The introduced black-tailed deer is widely distributed and numerous throughout South Moresby, and occurs on all off-shore islands. In winter the deer are often seen feeding along the beaches, and in summer they are seen in groups in the grassy meadows and river estuaries and in the alpine areas. Because these introduced animals found a favorable environment with no predators, their population has expanded to the point where there is now noticeable change in the vegetation throughout the Charlottes, including South Moresby.

Wildlife Use In South Moresby

The opportunity to view the vast array of wildlife is essential to the South Moresby recreational experience and is the primary use of the wildlife resources of South Moresby. Naturalists, photographers, artists and general recreationists are all attracted by the abundance of rare birds and the diversity of other animals in their natural setting. This recreational use of wildlife is further discussed in Section 3.3.

Wildlife is also of considerable scientific and biological interest because of the high degree of endemism, as well as the number and diversity of sea birds. Biologists have been attracted to the sea bird colonies for many years and studies of colonies continue. Research on the killer whale population was initiated in 1981.

At present there is very little hunting in South Moresby. Black bears are most frequently hunted because of their trophy size. The largest black bears in the B.C. Big Game Trophy Records have come from the Queen Charlottes and many hunters assume that trophy black bears are available in South Moresby.

One guide outfitter is presently licenced to guide over all of Moresby Island and the offshore islands. Most of his clients hunt for deer on the northern part of Moresby Island but he does guide one or two parties a year for trophy black bear to the inlets of the southeast coast. Over the last 10 years he has averaged two or three bears per year from the South Moresby area. In recent years he has been noting increasing interest from naturalists in his guiding services because of the coastal wilderness experience offered in his guiding area.

Few people hunt deer in South Moresby although the deer population is very large. This is because of the distance from population centers, the lack of road access and the availability of easier deer hunting elsewhere. Some deer are shot by local fishermen, food gatherers and the residents of Lyell Island.

The geese and ducks which rest and feed in the grassy meadows in several estuaries in the fall could also be hunted but at present they remain unexploited.

There are nine registered traplines which cover most of the South Moresby area including the off-shore islands. Marten, river otter and raccoons are the only species trapped, and the number trapped each year is very low. Seven of the lines are hereditary native lines which are administered primarily by the Skidegate Band Council and used by native trappers. No trapping returns are required on native lines although in recent years there appears to have been few visits to the area to trap. Returns for the two non-native trap lines indicate an average of 30 animals per year (mostly river otter) trapped over the last five years.

3.1.5 AQUATIC ECOSYSTEMS

A major feature of South Moresby is its rich and diverse aquatic environment. This includes freshwater streams and lakes, brackish estuaries and a wide variety of marine ecosystems. Comparative studies, such as those recently completed for Parks Canada, have concluded that South Moresby stands out above other areas on the northwest coast because of the diversity of ecosystems.

Freshwater ecosystems

The streams of South Moresby are typically short and steep and have relatively small drainage areas (generally less than 20 square kilometres). Most rise in the San Christoval Mountains and fall sharply from the steep hill sides. They tend to run out to the ocean through narrow, short, low-gradient floodplains which provide habitat for several fish species.

Resident fish, although numerous and widely distributed, tend to be small because the waters are cold and low in nutrients. Rainbow and cutthroat trout, Dolly Varden char, two species of sculpin and the three-spined stickleback are found in many streams. In some of the larger streams the rainbow trout are resident for two or four years. They migrate to the ocean as young fish and return several years later as adult steelhead trout. The streams are rich in clean gravel due to the steep active hillsides and heavy rainfall, and are therefore extremely productive for their size for the three species of salmon which enter the lower reaches of the streams to spawn. Pink, chum and coho salmon occur throughout South Moresby and form the basis of the commercial fishery. Sockeye salmon occur in one stream.

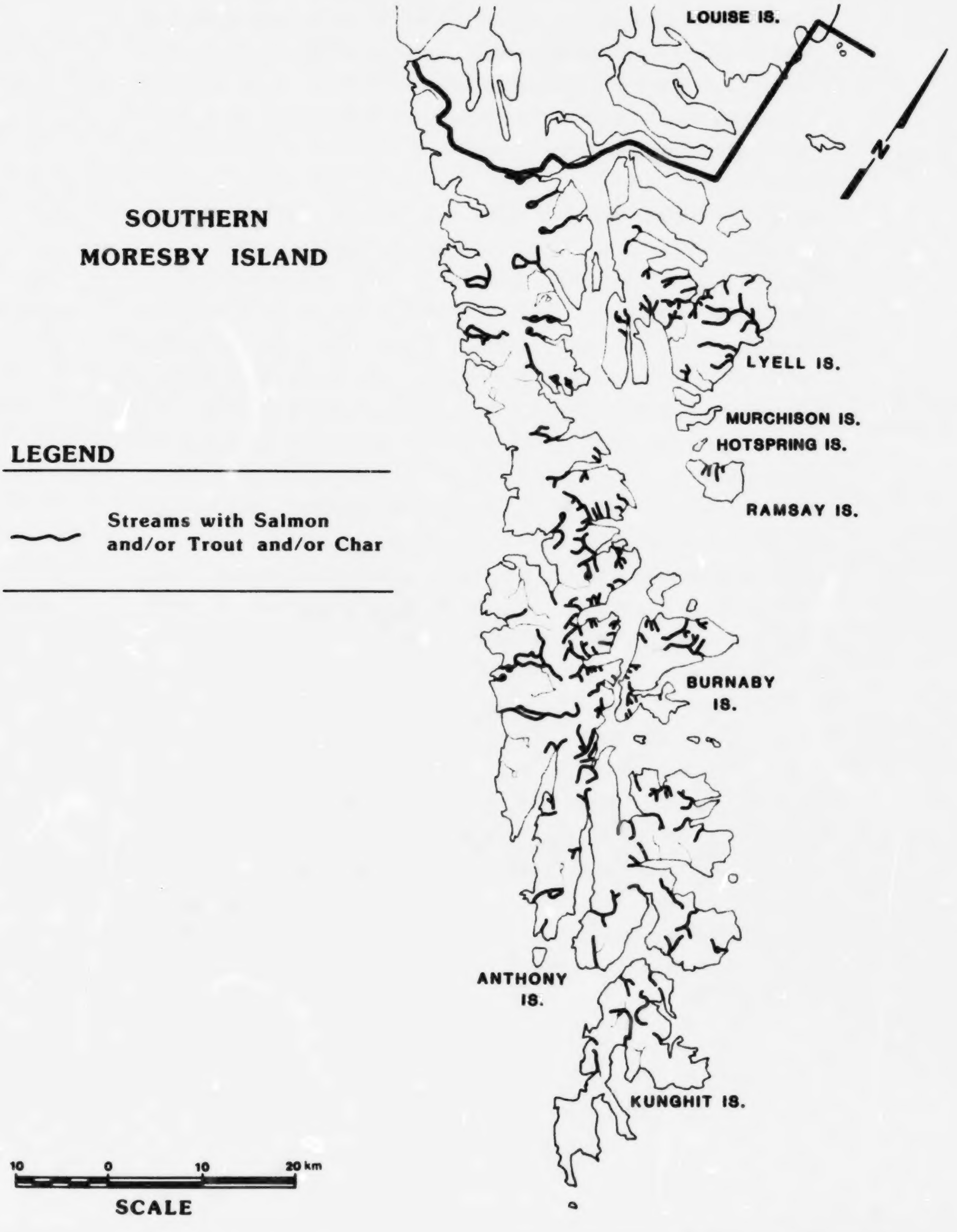
Pink and chum salmon predominate, with large runs of pinks every second year on the average. These fish school in the inlets and bays and move into the streams to spawn from September to November. The eggs hatch in February and fry emerge from the gravel in March and April. They migrate downstream to the ocean immediately, remaining close to shore for the summer months to feed in the estuaries and sheltered bays, and then move to deep water.

Adult coho salmon move into virtually all the low-gradient streams in South Moresby to spawn from October to February. The coho fry emerge from the gravel during May but, unlike the pinks and chums, remain in the streams for one or two years before migrating to the ocean.

Figure 8 shows the distribution of salmon, trout, and char in the South Moresby area and indicates the large number of streams on the west coast about which little is known. The known major salmon spawning streams and the average numbers of pink and chum salmon using each stream are listed in Table 5, Section 3.5.1.

The lakes in South Moresby are relatively small and are usually separated from the ocean by water falls. Fish species in the streams, such as salmon, are often absent from the lakes. Cutthroat trout, Dolly Varden char, and three-spined stickleback apparently reached the lakes thousands of years ago and in certain lakes have evolved a unique form. The stickleback in particular has adapted its body shape and size to combat predation in individual lakes.

Figure 8 FISH STREAMS


SOUTHERN
MORESBY ISLAND
LEGEND
Streams with Salmon and/or Trout and/or Char
LOUISE IS.
N
LYELL IS.
MURCHISON IS.
HOTSPRING IS.
RAMSAY IS.
BURNABY IS.
ANTHONY IS.
KUNGHIT IS.
10
0
10
20 km
SCALE

The freshwater ecosystems are sensitive because of their small size, steep hillsides and high rainfall. Isolation has allowed fish species to evolve distinctly over thousands of years. The freshwater ecosystems and particularly the stickleback that inhabit them have become part of a long-term study of evolution on the Charlottes and substantiate the indication that, because of their isolation, the Charlottes might be the best site in Canada for such studies.

The marine environment is richer than that of fresh water but is influenced by it. Some of the most productive aquatic environments in Canada occur where the two meet in the tidal marshes and estuaries. This is particularly true in Rose Inlet, McEchran Cove, Echo Harbour, Matheson Inlet, and Windy Bay where the estuaries are large and shallow. At the interface of land and ocean, estuaries provide life for many species of fish, wildlife, birds, plants, marine invertebrates and marine mammals. Biologically, they are important as habitat and as storehouses of nutrients which supply both aquatic and terrestrial environments. Schools of young salmon feed and grow in the rich waters in the spring and summer. Migratory waterfowl rest and feed in the calm waters and long grass of the estuaries in the fall. Other birds, mammals, fish and crustaceans feed at all seasons on this abundant food available in the estuaries.

The marine ecosystems of South Moresby are diverse. The long coastline (2 000 kilometers) is indented by many long inlets. Narrow channels separate the islands of the east coast from Moresby Island and create a complex of exposed and sheltered waters. The area is subjected to one of the largest tidal variations in North America and to some of the most violent storms. Strong currents run in the channels between islands and fierce tide rips occur where outflow from the inlets meet the waters of Hecate Strait. All of these factors create a marine environment which is diverse in substrates, depths, currents and exposure to wave action. Marine habitats range from protected shallows such as Dolomite Narrows with its rich and colourful array of starfish, shellfish and plants, to the deep, stormy waters around the Kerouard Islands and the westcoast of Moresby Island. A recent study undertaken for Parks Canada describes eight distinct marine habitat types and provides species lists for the marine plants, invertebrates and fish that are associated with each. For the purpose of this report, the Parks Canada habitat descriptions were combined into three broad habitat types.

The first major habitat type is the exposed bedrock shoreline of the west coast of Moresby Island and the steep headlands on the outer east coast. It is typified by exposure to extreme wave action and by nearly vertical cliff faces which plunge to considerable depth. These cliffs have only a narrow band in the intertidal area but the influence of the salt spray from waves extends far above the waterline. The plants and marine animals adapted to this dynamic habitat are limited in number but are locally abundant. In South Moresby the plants include surf grass, sea palms, bull kelp and heavy brown algae that can withstand the pounding wave action. Sea urchins, soft corals, giant acorn and goose neck barnacles cling to the cliff faces. Encrusting red algae covers most of the bedrock not occupied by other organisms. The barnacles and mussels found are among the largest found on the Pacific Coast.

The second major habitat type includes the semi-protected east coast islands and shorelines which are, typically, bedrock outcroppings interwoven with sloping beaches of boulders, cobbles, and pockets of sand. The large tides (-.5 meters to +8 meters) create an abundance and diversity of species which is greater than that found in the other two habitat types.

Subtidally, extensive beds of Macrocystis, Nereocystis and feather boa kelp provide shelter for a rich community of rock fish, greenlings, top snails, decorator crabs, and other fish and invertebrates. Perhaps the most notable is the herring schools throughout these kelp beds and spawn in great numbers. They provide a major food source for larger predators such as salmon, halibut, cod and diving birds. On the ocean bottom are a profusion of abalone, red anenome, sunflower stars, red turban snails and purple hinged rock scallops.

In the intertidal zone, thick carpets of rock weed and eel grass support a community of periwinkle snails, barnacles, mussels and tiny shore crabs. The numerous varieties of red, green and brown algae found in the subtidal and intertidal zones attest to the clear, unpolluted waters of South Moresby.

The third and most extensive habitat type is found in the protected waters of the bays, inlets and sounds of both the east and west coasts. This habitat type has a variable shoreline. In the inlets it is steeply sloping bedrock; in the bays it has a gently sloping boulder and cobble bottom. The waters are calm and there is more mixing with the fresh water from the streams. Because of this protection from storms the fauna and flora tend to be similar even on different substrates.

This habitat *type* has a relatively limited range of species. Rock weed, eelgrass and sea lettuce are the most common plants in the intertidal area. *Nereocystis* and *Macrocystis* kelp beds occur along the rocky shorelines in deeper water. Many species of starfish, including the purple star and the large predatory sunflower star, sea cucumber, moon snails, chitons, limpets and several species of clams inhabit the subtidal and intertidal bottom. However, compared to the profusion and diversity of plants and animals in the semi-protected zone, this habitat type is relatively barren.

There is an additional habitat unit which, though limited in size, deserves special mention. This unit occurs where strong currents run through narrow channels on the east coast because of the great fluctuation in tides. These currents create special and extremely rich marine ecosystems in a few specific locations - Dolomite Narrows, Houston Stewart Channel, and between Faraday and Murchison Island. The constant movement of plankton-rich waters over these shallow areas produces tremendous quantities of feed. This in turn supports proliferation of intertidal life. A multicolored array of bat stars and sunflower stars occupy the gravelly bottom with a multitude of red turban snails, clams, burrowing sea cucumbers, blue mussels, barnacles and algae. Feather boa kelp, bull kelp and other long kelps stream out on the currents. Both the diversity of species and the abundance of each are exceptional in these habitats.

Many species of fish inhabit the marine waters of South Moresby. The list of over 150 species includes a wide variety ranging from the bottom fish to pelagic giants such as halibut and tuna and occasionally even exotics such as the great white shark and ocean sunfish. Some fish are resident; others are migratory and pass the shoreline of Moresby, feeding as they move. Only a few of the species are commercially utilized at the present time. Marine mammals are discussed in Section 3.1.4.

Large blooms of microscopic plants and animals occur in the summer when the water is warm and the Japanese current moves closer to the shore. Jellyfish proliferate and many species of plankton create bioluminescence in the water at night. By contrast the spring and early summer water is very clear and visibility extends many meters down.

3.1.6 DISTINCTIVE FLORA AND FAUNA

The Queen Charlotte Islands are among the most isolated islands in Canada and as a result are of special interest in the study of biological evolution. Separated from the mainland by some 60 kilometers of ocean, the Islands have been shielded from the spread of mainland species in recent times. This barrier has given rise to an impoverished flora and fauna which excludes many species found elsewhere in British Columbia. This isolation has given rise to a higher degree of endemism than in any other area of comparable size in Canada. Many species and varieties are found only on the Charlottes, or only on the Charlottes and in Asia. The presence of these endemic and disjunct forms suggests that a portion of the Charlottes remained ice-free during the last (Fraser or Wisconsin) glaciation. Sediments indicating a well-established plant community on the Charlottes some 16,000 years ago have recently been found, thus supporting the hypothesis that glacial refugia exist. It would appear that the ancestors of the Islands' many unique species arrived before that time and became isolated by the rising seas at the end of the last glaciation.

Four species of moss and one species of liverwort are endemic. Twelve species of moss are only found on the Charlottes and in distant lands such as Asia or Scotland.

Of the flowering plants, six species are found only on the Charlottes. Eight are found only on the Charlottes and the Brooks Peninsula on Vancouver Island, which underwent a similar glacial history. Fourteen exhibit unusual disjunctions and approximately another 20 represent the range limits of their species.

At least three species of beetle exist only on the Charlottes. Three of them were found only last year. Their closest relations are found around the north Pacific and are the subject of current research bearing on the distribution of refugia during the last glaciation. Other endemic species of insects are likely to be found, and endemism in butterflies has been suggested.

One species of sand hopper has been found on the west coast which is similar to forms found in the fresh water streams of Japan.

Freshwater stickleback fish show a unique degree of variation from one lake to another. These populations evolved distinctly from a common parent stock which was introduced to the lakes by a higher sea-level several thousand years ago. Receding seas isolated the populations in hundreds of separate lakes, many in South Moresby, creating excellent laboratories for the study of evolutionary adaptation. Over a decade of meticulous research has been done on this fish, mostly on Graham Island. Endemism is also expected with other fresh-water fish.

Three subspecies of the hairy woodpecker, saw-whet owl, and the Steller jay are found only on the Islands. A variety of the pine grosebeak is found only on the Charlottes and on Vancouver Island. The song sparrow occurs only on the Charlottes and in Alaska. Seven species of land mammals are endemic to the Queen Charlotte Islands, plus the Dawson caribou which became extinct in the 1920's. The weasel, marten, bear, two species of shrew and two species of deermouse are distinctive. The Charlotte river otter is also considered to be unique.

3.2 Cultural Heritage

3.2.1 HERITAGE SITES

The investigation of archaeological sites is the only access we have to over 99 percent of the history of man on Earth. Even in recent or present history, archaeology can provide information that can be reached in no other way.

Recent research on the last ice age indicates that the northeast part of Graham Island was ice-free 16,000 years ago, a time of maximum Fraser Glaciation in southern B.C., and that it remained ice-free thereafter. It is possible that the Islands were inhabited by man at that time, but considering that cultural remains would have been scarce at that time, compounded by the fact that exposures of strata that age are rather rare, it should not be surprising that archaeological evidence has not yet been found. Human settlements, probably located near shorelines, would now be below the sea or elevated above it because of changing sea-levels from the terminal Pleistocene to recent times.

The earliest site on the Charlottes dates to some 7,400 years ago. This type of site is associated with a sea-level some 12 meters above present. There is an absence of structural remains and an absence of dense shell middens. Chipped and flaked stone are common as are small, skillfully made microblades used to form a cutting edge on a shaft of bone or wood.

Deep shell-middens from about 5,000 years ago, are found associated with a sea-level some nine meters above the present one. Microblades disappear, and flaked stone is augmented by pecked ground and polished stone and bone tools. Rock-lined cooking hearths are found.

After about 3,500 years ago, archaeology indicates a gradual evolution into the culture we know ethnographically as the Haida. The influence of European and Western technologies, beginning some 200 years ago, resulted in an immediate fluorescence of Haida culture which can be seen in early photographs of historic villages, followed by cyclic advances and declines caused by disease and a dependence on international trade and a world market economy.

The discovery of an archaeological site is not a simple process. Despite the sophistication of reconnaissance techniques, the inventory of sites on the Charlottes is far from complete. With the exception of recent settlements such as the abandoned villages of Nunstins, Tanu and Skedans, sites which show obvious signs of Haida forest use, (fish weirs in streams, totem poles and massive house remains) most sites are buried and hidden from casual view. Thus the obvious ones are those which are being uncovered by development, blown down trees, and erosion. Considering the time span of human occupation and the wide range of habitable shorelines, reconnaissance can discover only a small fraction of the actual distribution of sites. Only with the use of coring and test-excavation can we hope to complete an inventory.

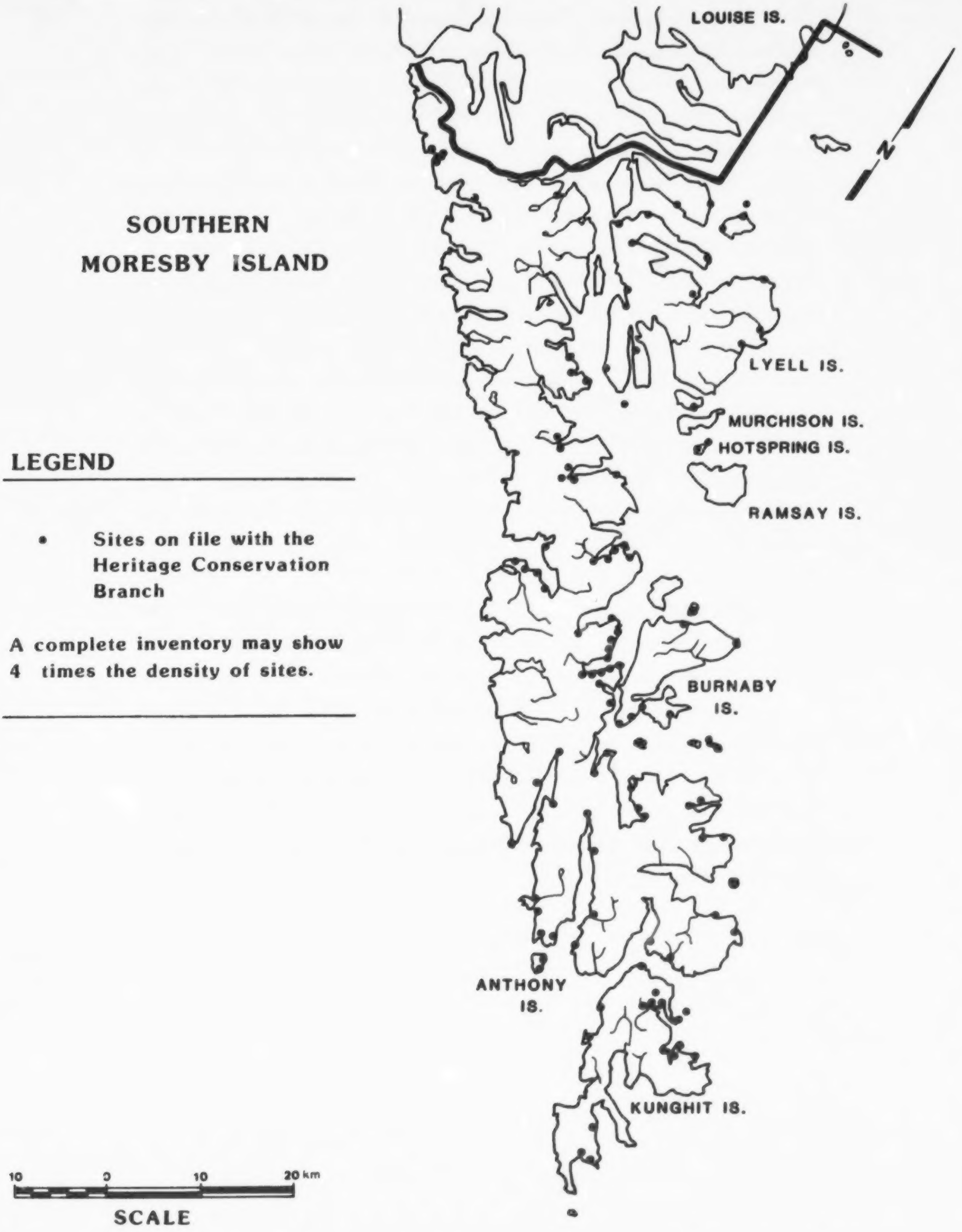
Consensus on the route by which man entered North America from Beringia during the late Pleistocene remains unsettled. Over a decade ago, an "ice-free corridor" was proposed, formed by the incomplete union of the Cordilleran and Laurentide glaciers at the eastern edge of the Rocky Mountains. Such a corridor, it was argued, would have been the first route open to early man. An alternative route was later proposed by which man could have progressed along the coast over a series of ice-free refugia located at sea-level along the North Pacific. The recent finding of 16,000-year-old plant remains, as well as research on endemic mammals, birds, plants and insects, some with associated relatives around the North Pacific, would lend credence to the latter hypothesis. Therefore, the Charlottes are likely to play a key role in understanding the arrival of early man.

The importance of Haida archaeological sites cannot be overestimated. The Haida epitomize the Northwest Coast Cultural Tradition. Their relative isolation and the abundance of a refined monumental art have interested both scholars and lay public from around the world. The World Heritage Site of Anthony Island is an example. It is also rare to find archaeological sites as well-documented historically and photographically which span the time from initial contact with Europeans to their abandonment. These sites constitute an irreplaceable record of the changes wrought upon a non-industrial society by an industrial one.

Archaeological sites were recorded early by Dawson, Newcombe, Swanton, Smith and others. Extensive reconnaissance was conducted on Graham Island by Fladmark and Gessler in the 60's and 70's; they have also recorded some sites on South Moresby Island. Various others have reported sites in South Moresby, but the only extensive survey there was by Hobler in the mid 1970's. The survey was done by boat, with 18 days devoted to the west coast, and 50 days devoted to the east. The coverage of the west coast shoreline was proportionately less than the east. This survey accounts for a major part of the total sites recorded by the Heritage Conservation Branch (see Figure 9). Still, large stretches of the coastline were not covered, Haida forest use sites were not systematically sought, and certain terrains were dismissed as unlikely for habitation. Given these considerations, along with the previous generalizations on the difficulty of finding sites, it is easy to understand that the present inventory is far from complete. A survey of leading senior archaeologists and ethnologists with expertise in the area estimated the completeness of the present inventory at a median of 20 percent of the west coast, and 30 percent of the east coast.

In addition to sites which are officially inventoried, some generalizations may be made on where further sites will be found. Except for Haida forest use in the form of tested and bark-stripped trees, canoes, trails and the like, most sites will be found in a zone bounded by a 15- to 20-metre elevation contour and the present shoreline (or below). Any beaches or coves that look habitable today were probably inhabited in the past. Virtually all cliff overhangs or rock-shelters and caves are archaeological sites. Site density increases as one travels south.

Figure 9 ARCHAEOLOGICAL SITE SURVEY


SOUTHERN
MORESBY ISLAND
LEGEND
• Sites on file with the Heritage Conservation Branch
LOUISE IS.
N
LYELL IS.
MURCHISON IS.
HOTSPRING IS.
RAMSAY IS.
BURNABY IS.
ANTHONY IS.
KUNGHIT IS.
10
0
10
20 km
SCALE

A complete inventory may show 4 times the density of sites.

The types of sites found in South Moresby are roughly typical of the types of sites found on the Charlottes as a whole. There are 113 sites presently inventoried in South Moresby. Based on the median estimates of the completeness of the inventory, the area may contain over 400 heritage sites.

3.2.2 HAIDA CULTURE

Hundreds of generations of human beings have been nourished by the land and sea of the South Moresby area. The area provides an abundance of the essential ingredients for sustenance and growth. Readily accessible foods encouraged the development of a complex society and the creation of a highly regarded art form.

Cedar bark and spruce root baskets, of all shapes and sizes, were made for the harvesting of foods. Great attention was paid to the preparation of these foods which were served with alder or horn ladles from elaborately carved trays. The diners sat on cedar bark mats and ate from delicately carved bowls.

Cedar is the primary medium of artistic expression and a vital aspect of the Haida culture. Massive cedar monuments in the form of Totems and impressive cedar houses displayed the crests of their owners and dominated the shorelines of the Haida lands. Kerfed and bent cedar boxes, baby cradles, water buckets, tackle boxes, ceremonial chests and coffins, made in pre-contact and historical times, rival the craftsmanship of today. The engineering and artistic design of the Haida canoe has established its place in the world of boat building. Through their artistic expressions as well as other traits, the Haida people developed one of the world's great cultures.

Initial contact with Europeans, less than 200 years ago, brought revolutionary and devastating change. The Haida nation was abruptly brought into world trade by an economic system spurred on by the Industrial Revolution. It was a brief encounter, as world markets and the fashions in larger civilizations changed. Haida technology and social structure were permanently altered. The Haida remained on the fringe of European expansion, witnessing decades of colonial European culture which offered services and opportunities only in the urban economic centres.

Contacts with Europeans brought plagues of smallpox and other diseases which nearly annihilated the Haida nation. The population, greatly reduced from thousands to a few hundred, survived to face an alien culture and ideology.

The Haida not only survived but carried and adapted their cultural heritage into the mainstream of twentieth century North American society. Today, though better traits of both cultures have combined to achieve a wide variety of lifestyles and careers, traditional hunting, gathering and the preparation of native food is still a part of everyday life. In contrast to European concepts of wealth, the traditional accumulation of property for redistribution is the Haida means of gaining prestige and validating hereditary rank. Feasting, giving and sharing is still the Haida way "to make one's name good". Song and dance is still a necessary part of social ceremonies.

The industrial resource extraction of the last few decades has compromised traditional food sources and the inherent quality of the land. Salmon stocks continue to decline. Abalone is being sacrificed to commercial interests. Cedar, the cornerpost of Haida culture, will be practically non-existent in second-growth forests. Where it does survive, the small size and poor quality of the second-growth cedar will render it unsuitable for cultural use. The average age of totem pole and canoe cedar is several hundreds of years, but in the second-growth forest the cedar will be logged before the first century has passed. A considerable part of the Queen Charlotte Islands has already been given over to industry while aspects of traditional culture have been diminished proportionally.

It was once thought that the Haida culture would continue as long as there were Haidas; it is clear now that this is not the case. Having survived the cultural domination, repression and diseases of the past, there is a justifiable fear that continued industrial expansion has the capability of putting the Haida cultural heritage to an end. A balance between traditional and industrial values can be reached; South Moresby is one of two essentially intact yet distinct areas on the Islands which have been identified as being essential for the preservation of the Haida heritage. South Moresby is capable of supporting many forms of life while at the same time sustaining Haida culture. The fate of the Haida cultural heritage parallels the fate of the land.

3.2.3 RECENT HISTORY

Aside from the early marine fur-trading contacts with Indian villages, the history of European activity and establishment in the South Moresby area goes back just over 100 years. This involvement centred around mining, fish processing, and forest industries.

During the peak period of industrial activity, a regular steamship service was required to service the industries and the resident population. At that time the population of South Moresby was a significant portion of the total Charlottes.

Mining

In an industrial context, mining has been a prominent feature of South Moresby for over a hundred years. The earliest mining development at Mitchell Inlet in 1852 led to the establishment of the Queen Charlotte Islands as a Crown colony in 1853. In 1862 an engineer named Francis Poole prospected for copper on Copper Island and later on Burnaby Island, in a search for copper. After 18 unsuccessful months the project was abandoned. In the following decades there were several prospecting booms with temporary developments on many of the islands, including Hotspring. There were some successes. From 1902 to 1917 small shipments of copper ore were made from East Copper Island, but the major developments occurred in the Ikeda Cove-Collison Bay-Harriet Harbour area, and at Klunkwoi Bay.

The Ikeda Mine, at Ikeda Cove, profitably produced copper for about 15 years. The Jedway townsite developed in Harriet Harbour, with cabin homes, a sawmill, hotel, and store. A government wireless station was established in the area, and the first telephone line in the Charlottes was built, linking Jedway, Ikeda Cove and Collison Bay. By 1920 mining and exploration activity subsided and the town was virtually abandoned. In 1961 the area revived with the development of an open-pit iron mine at Jedway, employing nearly 150 people. Two million tons of ore was shipped to Japan over the following five-year period. This project was accompanied by a revival of prospecting throughout the area, but no further development ensued. The Jedway orebody was exhausted in 1968 and the mine closed permanently.

Concurrent with the early development at Ikeda and Jedway, active prospecting and exploration for copper occurred in the area of Klunkwoi Bay. The community of Lockeport was developed to service these activities, complete with a store, mining recorder and residences. Lockeport functioned as a mining centre until 1931. Virtually nothing remains today.

Fisheries

Fish processing, including salmon canning, whale processing and salteries, was an active industry in South Moresby for over 30 years. A prosperous whale processing station operated at Rose Harbour from 1910 to 1943. At Lockeport, about the time of the decline of mining activity, a fish cannery was established in 1918 and operated intermittently until 1928. A community was maintained at Lockeport until the post office closed in 1938 and the settlement became a ghost town. In the area of Jedway, several Japanese salteries and an abalone cannery operated for several years subsequent to 1926. Prior to 1913 a small abalone cannery operated on Murchison Island.

Forestry

South Moresby timber has been subject to harvest since the early 1900's. Small scale logging and sawmilling operations produced lumber for the community at Jedway around 1910. During the First World War camps were established throughout the northern portion of South Moresby to log high-quality spruce for the construction of airplanes. In the 20-year period from the mid-twenties to the mid-forties over 5 000 ha were logged by three major companies. These operations were spread over Lyell, Tanu, Richardson, Kunga, Shuttle, Murchison, Furaday, Huxley and Burnaby Islands. This was predominantly A-frame logging whereby the logs were yarded into the water by a machine on a barge anchored along the shore. The most active period was from 1935 to 1943, when over 400 hectares of forest land were logged annually, almost twice the current rate.

3.2.4 ART

Art may be considered a measure of cultural development. In the case of South Moresby, art forms are a direct reflection of the richness of the land. Over thousands of years the Haida people have developed a unique art, inspired by the land and sea. Images of the creatures who shared the Islands with the Haida were portrayed on common household utensils, ceremonial objects and monuments. Masks and totems were made from abundant, high-quality cedar. With the arrival of the first European explorers and traders came the artists of a new culture. A different style was introduced, still inspired, however, by the land and culture of the Haida.

The first of such undertakings were the engravings and sketches of ship's artists of the scenes of contact between cultures. These were accompanied shortly afterwards by anthropologists and explorers such as Swanton, Dawson, Curtis, Newcombe, Barbeau and Boas, who drew and photographed the land and culture extensively.

This early body of work is a major source of information for cultural research, publications and educational programs by the work of anthropologists and archaeologists today. It is also a source of research and inspiration for contemporary Haida artists. The ancient legends and images recorded by these men are today reworked into wood, precious metals and argillite, contributing to a renaissance of Haida artforms. The next phase of artistic interpretation of the South Moresby area occured during the first decades of this century. It was a period when European painting techniques were utilized in the landscapes of Canada's Group of Seven. On the West Coast, their contemporary was Emily Carr.

Carr's works, which include depictions of her extensive travels through the South Moresby area have now become a treasured and vital part of contemporary West Coast culture. Numerous film and television projects and books written by her and about her have made her life and works a prominent thread in our cultural fabric.

Today, as in the past, the area continues to attract the attention of accomplished artists. Within the past few years, as South Moresby received wider recognition, the area has been visited, painted, sketched and photographed by internationally respected artists such as Toni Onley, Jim Willer, Freeman Patterson, Robert Bateman and Benita Sanders. Haida artists frequent South Moresby for the inspiration that has given their art a prominent place in contemporary times.

South Moresby has also recently become an outdoor education facility for artists and photographers. In 1982, instructional field trips were led by Bateman and Patterson, among various other artists, and also by the Emily Carr College of Art in Vancouver.

The sum of this considerable output over the past century, constitutes an important element in our contemporary west coast culture. From post cards to fine art prints, from original paintings to photographic exhibitions these works reflect a considerable portion of our province's artistic expression. Cultural expression is our way of understanding and appreciating the world around us, and ultimately of celebrating our place within it. It is through such expressions unique to the west coast that our identity has evolved. It is often with these same images that we fill our embassies and advertising, and relate ourselves to the rest of the world. The source of inspiration for much of this work has been South Moresby.

3.2.5 ECONOMIC VALUE OF ART

The resources and expertise needed for a rigorous analysis of the economics of the arts in South Moresby have not been available to the planning team. Therefore only an indication of economic values can be offered through a superficial sample of available information. No attempt is made to assess employment values and government revenues accruing from the arts.

In the fine arts graphic media (painting, printmaking, etc.), seven contemporary artists available for consultation estimate gross sales of recent works directly attributable to South Moresby at $700,000. Six of these artists stated that production of new South Moresby art is ongoing.

Works produced by Haida artists are more difficult to assess. Totem poles are currently commissioned at a rate of approximately $10,000 per cubic metre, and run an average of 10 cubic metres per pole. The value of museum specimens of poles is roughly equivalent, and may be applied to some 50 poles in museums around the world.

Large numbers of silkscreen prints, smaller wood and argillite carvings, gold, silver and copper jewellry are produced and marketed locally and internationally. However, the widespread nature of this market, as well as the number of artists make accurate assessment extremely difficult. The same complications are encountered in measuring the value of the thousands of smaller museum pieces and items in private collections around the world. It is also difficult to determine the proportion of Haida artistic and economic activity which is currently attributable to South Moresby.

Numerous books, scientific papers and magazine articles have been published which relate, in whole or part, to South Moresby. A well-known, two-volume book of the history of the Charlottes (Dalzell, 1968, 1973), which deals extensively with South Moresby, has grossed sales of over $580,000 to date. Another publication about to be released which deals exclusively with the natural and political history of South Moresby has projected gross sale revenues of $525,000. Information on other publications, ranging from light tour guide reading to anthropological references and "coffee-table picture books", was not solicited.

The nature of commerce in works of art is complex. It is only within the past decade that is has received professional analysis. Many fine art products are sought as investment properties and are often subject to resale at escalating values, therefore providing repeating economic stimulation. In addition, participation in the arts is usually accompanied by a variety of other activities, such as restaurant and theatre participation. The arts also form an important component of B.C.'s urban tourist industry. The Emily Carr Museum, the Provincial Museum in Victoria and the U.B.C. museums often exhibit works of art produced in South Moresby.

It is recognized that the direct expenditures of those involved in art generates additional economic activity through the supplies of goods and services to professional ventures as well as by the expenditures of persons employed. This additional activity is often referred to as the multiplier effect. In the absence of factual knowledge concerning the relationship between direct and indirect and/or induced expenditures, the level of economic activity arising through the multiplier has not been quantified. However, a recent study by the City of Vancouver, Cultural Services Division indicates that the wide range of tools, techniques, supplies and materials utilized by artists, publishers, museums and film makers could provide for a multiplier of 1:2.5.

A great number of people can utilize the non-economic values of art through the media of books, articles, film and television. Within the last few years, approximately 10 films have been made about the Charlottes, all of which had as their central theme either the natural or Haida history. These films are listed in Table 2 below. Publications concerning the Islands are listed in the References section under the Natural and Cultural Heritage category.

TABLE 2: Recent Films Produced on Queen Charlotte Islands

Film Title	Country
The Nature of Things: Windy Bay and South Moresby	Canada (CBC)
Bellamy's America	Britain (BBC)
Les Animaux du Monde (Television - Francais 1)	France
Bill Reid	Canada (NFB)
Skidegate Pole Raising	Canada (NFB)
Diary for a Place in Time	Canada (NFB)
Wild Canada: Enchanted Islands	Canada (CBC)
Indians Of The Q.C. Islands	Japan
Anthony Island	Canada
Seasons In The Sun	Canada
Land of the Totem	Canada

3.3 Wilderness and Recreation Values

3.3.1 WILDERNESS VALUES

Within the past decade, concern for the preservation of wilderness areas has gained prominence in provincial land use issues. Human population growth, continuing resource exploration, discovery and development have had significant effects on the land base of the province. Government ministries with management responsibility for various resource uses have also sought to protect the land base available to their respective mandates.

The net result of this process has been two-fold. First, wild places, formerly in seemingly endless supply in B.C., have been significantly reduced. Areas not actually subject to settlement or resource use have largely been planned for, classified, and committed to ensure their availability for future resource needs.

The second result has been an increase in society's awareness and appreciation of the values of wilderness. By a process of elimination, those areas which today remain relatively undisturbed have become more valuable. In economist's terms, it is a simple case of a diminishing supply creating an increasing demand.

It is apparent that wilderness offers opportunities which are important to society and which are not available where resource extraction industries prevail. The characteristics of wilderness which ensure its value to society include:

WILDNESS	- lack of the marks of contemporary man.
ECOLOGICAL STABILITY	- tending towards climax flora and a natural abundance of fauna in terrestrial or aquatic habitats.
SECLUSION	- giving a sense of distance from civilization; being masked from the sights and sounds of industrial development.
HISTORICAL SITES	- archaeological sites and evidence of traditional aboriginal and historic land uses.
SIZE	- the opportunity to experience travel through an unbroken wilderness area.

As simple as it is, the first value - lack of marks of contemporary man - is the key value. It dominates any consideration for designation and management of a wilderness area.

Areas exhibiting the above characteristics provide extensive opportunities for public enjoyment. Some of these opportunities are:

- to observe marine and terrestrial wildlife in their natural habitats;
- to conduct educational programs and scientific research;
- to observe awesome or scenic landscapes;
- to exercise wilderness travel skills such as backpack expeditions, mountaineering, kayaking, sailing or other boating expeditions.
- to observe the land's capacity to recover the natural or wild appearance of places which have been disturbed by man in the past.

Although wilderness does offer economic opportunities to some non-consumptive industries, it's key value lies within itself and the unique form of experience it provides. Naturally, this experience varies from individual to individual.

To some, wilderness offers the personal challenge of developing survival skills. To others it provides spiritual communion or cultural inspiration. To the scientists, naturalists and educators the wilderness is an enormous storehouse of knowledge and future discovery that cannot be replicated. To most, the wilderness offers an opportunity to "just get away from it all".

Finally, there are those who rarely visit wilderness places, yet these people still desire the knowledge that there exists places on this planet which are not given over to mankind's industrial needs - places where nature's life forms predominate solely for their own sake.

South Moresby possesses all of these essential characteristics which collectively create the high value that society places on wilderness areas. A relatively clear absence of the marks of contemporary man through most of the area, a distinct perception of seclusion from civilization, a large size and an ever-present sense of previous cultural occupation are all exemplified in the study area.

The landscapes and natural life forms found in this distinct land/ocean environment also provide outstanding opportunities to experience and enjoy the wilderness character of the study area. The scenic landforms and waterways combined with the varied and abundant plant and animal life provide extensive opportunities for a wide variety of recreational and learning experiences. At the present time activities include: boat touring, camping, diving, beachcombing, hunting, fishing, photography and art, nature appreciation, food gathering and natural and cultural history education.

3.3.2 CHARACTERISTICS OF RECREATIONAL USE

Recreational Environment

Most recreational use of the South Moresby area at the present time is founded on the wilderness and scenic values present. From the wilderness adventurer circumnavigating Moresby Island to the commercial fisherman visiting Hotspring Island for a bath and campfire on the beach, all are attracted to the outstanding scenery and sense of remoteness of the area.

The intricate shoreline and complex groupings of islands and waterways (200 kilometres of shoreline) create a sense of vastness that makes the area seem far larger than its actual physical size. The only year-round habitation here is the logging camp community in the northern part of the study area and the Cape St. James lighthouse to the extreme south.

There are no services (gas, food, lodging) in South Moresby except commercial boat tours during the summer months. The only communication or emergency services offered are found at existing habitations or on larger boats moving through the area. The weather patterns of this area are a significant limitation to the season of recreational use with frequent storms in all but the summer months.

Access

Access to the area at the present time is by water and air only.

Recreation boat access varies from canoes to luxury yachts with all types of sailboats, inflatable craft, kayaks and power boats visiting the area. Water access originates primarily from the populated centres of the Queen Charlotte Islands to the north or by commercial fishermen entering the study area at a variety of points from surrounding waters. Larger sailboats and commercial tour boats enter the area from the south across Queen Charlotte Sound.

Air access to the study area is primarily by small float plane or helicopter charter from Sandspit on northern Moresby Island. Air charter is usually for short visits to particular recreational or archaeological features or to shuttle visitors to tour termination points.

Patterns of Use

Current patterns of use within the area are primarily based upon a variety of boat touring areas and circuits incorporating a number of recreational focal points. Visitors entering the study area from the north travel either the east or west coast of Lyell Island into Juan Perez Sound with its focal point of Hotspring Island. Many explore the Burnaby Island-Skincuttle Inlet areas and the Kunghit and Anthony Islands areas further south before returning by a similar route north or being picked up by airplane. The many islands on this sheltered east coast waterway create a variety of routing alternatives to this general touring circuit. A broad range of diving, food gathering, nature study and hiking opportunities are associated with these routes.

Larger boats entering the study area from other directions often follow the same general touring routes or simply visit a focal point such as Hotspring or Anthony Islands. A few visitors tour the rugged exposed west coast to circumnavigate Moresby Island. This area offers an outstanding wilderness experience but does not have the natural shelter of the east coast and is therefore more hazardous and visited by fewer boaters.

Commercial recreation and tourism on and around South Moresby Island has existed for many years on a small scale, primarily in the form of guided hunting and salt-water fishing charters. In recent years, however, there has been a growing interest in commercial tours that center around the natural and heritage resources of the region. The marine-land interface is a key element of the tours provided by commercial operators.

The tours currently offered emphasize sea kayaking, scuba diving, photography, field educational experiences, cultural and heritage experiences and fishing and hunting charters. The groups are kept small (10 to 15 participants) and are usually water-based. The tours are led by people who are knowledgeable about the natural and cultural history of the region.

The season of recreational use in the study area is generally from June to September. Fishing and hunting trips run into the fall months as well. The length of trips into the study area averages 10 days, but the range is from a few hours for an aircraft trip to over a month for some kayak trips.

Visitors to South Moresby come from all over the world, about 85 percent being non-Queen Charlotte Island residents.

Levels of Use

Current levels of recreational use in the South Moresby study area is moderate but growing. Although no complete account of volumes and characteristics of recreational use are available, the commercial charter activity is well recorded and enough information exists on non-commercial use to allow rough estimates to be made.

The commercial recreation activity in the study area has shown a major increase in recent years with not only the number of operators increasing, but the number of trips and volume of visitors increasing dramatically (Tables 3 and 4).

TABLE 3: Commercial Recreation Operators in South Moresby Island

Type of Operator	1980	1981	1982
Wilderness/Naturalist	4	5	6
Diving/Fishing/Hunting	3	5	5
Educational Programs	2	3	2
Total Commercial Operators	9	13	13

TABLE 4. Number of Commercial Recreation Trips, Visitors and Visitor Days for South Moresby Island 1980-1982

	1980	1981	1982
Trips	23	60	54
Visitors	189	547	482
Visitor Days	1,600	3,649	3,994

Non-commercial recreational use of the study area is also known to be increasing. However, levels of use are not as accurately recorded. Data exists from visitor registration at Anthony Island Provincial Park, a guest book maintained by Chief Skidegate at his cabin on Hotspring Island and various personal recordings of visitor activity. From these sources it has been conservatively estimated that there were 250 to 350 non-commercial visitors (excluding commercial fishermen) in the study area in 1982, accounting for approximately 2,500 to 3,000 visitor days of use.

In total, approximately 800 recreationists visited the study area in 1982 staying for a total of approximately 6,800 visitor days.

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In total, approximately 800 recreationists visited the study area in 1982 staying for a total of approximately 6,800 visitor days.

Rates of growth of recreational use in the study area are difficult to determine. Because the rapid growth in commercial recreation in South Moresby is such a recent phenomenon, there is little time series data to forecast an accurate projection of future use. Since 1980, however, there has been over a 100 percent increase in the total number of trips, number of visitors, and visitor days. There is also a major increase in the number of trips being advertised for 1983.

These growth rates are comparable to other studies which have examined the market potential for commercial outdoor recreation in British Columbia. These studies forecast annual growth rates of 10 to 30 percent over the next five to 10 years for commercial outdoor recreation activities. This compares to a four to five percent forecast of growth in tourism as a whole in B.C. in the next five to 10 years.

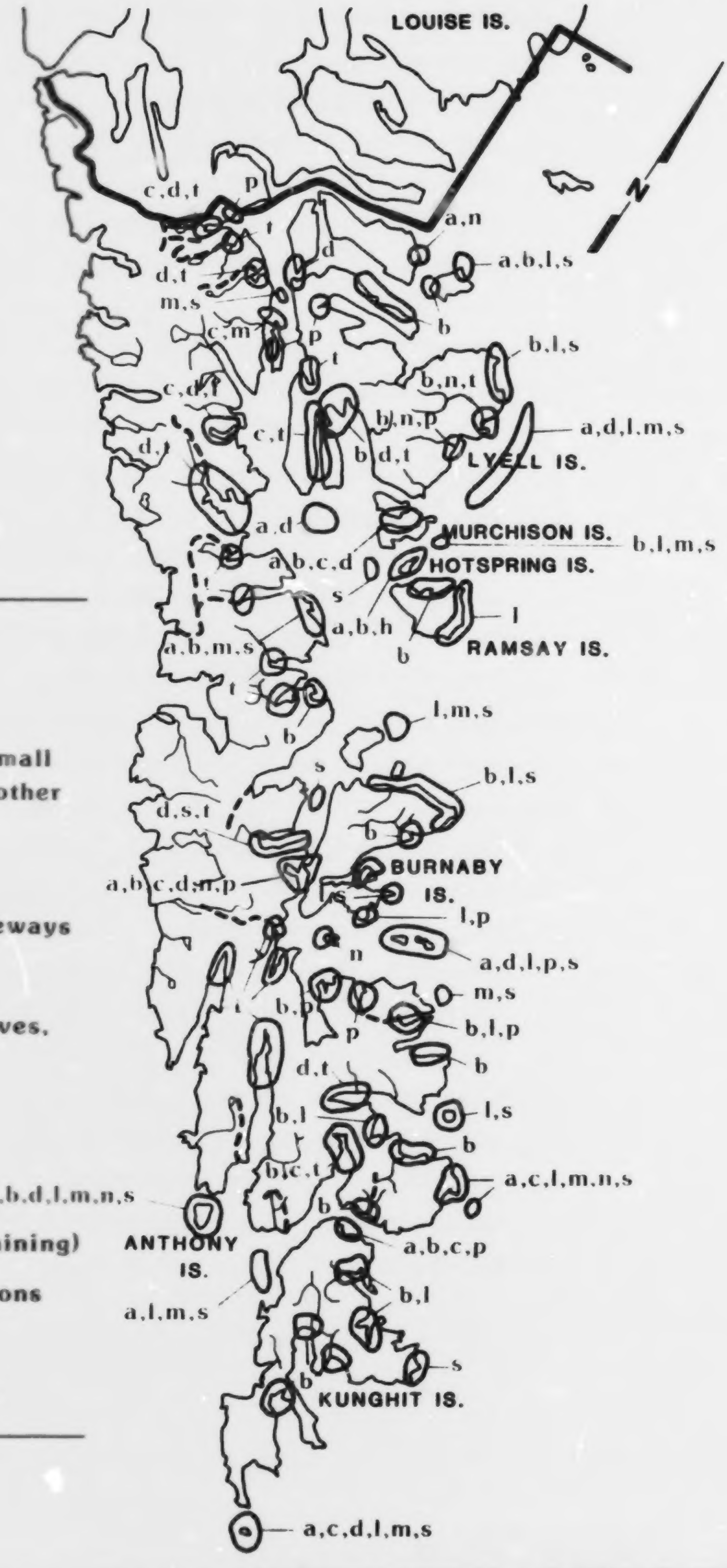
It is anticipated that non-commercial recreation in South Moresby has a similar growth potential although the ultimate upper level of use is unknown.

3.3.3 RECREATIONAL FEATURES

In combination with the wilderness characteristics of the area, the recreational attraction of South Moresby is directly related to the abundance, diversity and uniqueness of natural and cultural features present. Many of these features have been discussed in previous sections of this report (geology, vegetation, wildlife, aquatic ecosystems and heritage sites). The following section highlights those features that contribute most significantly to the recreation attractions of the study area. Figure 10 gives some indication of the general distribution of recreational features throughout the study area. This map shows that the features are relatively dense, with no one area being notably scarce or abundant in features compared to another.

Figure 10 RECREATIONAL FEATURES OF SOUTH MORESBY

SOUTHERN
MORESBY ISLAND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KUNGHIT IS.
a,c,d,l,m,s

LEGEND

a	intertidal/subtidal marine life
b	beaches (major beaches or small beaches in association with other features)
c	tidal currents
d	small islands, caves, passageways
h	thermal springs
l	coastal landforms - cliffs, caves, arches
m	marine mammals
n	archeological sites (major visible remains)
p	historic sites (settlements, mining)
s	seabird colonies, concentrations
t	tidal marsh/flats
- - - -	trails (or routes utilized)

10 0 10 20 km

SCALE

For the purposes of this review the area has been subdivided into four recreational feature regions: the east coast, the San Christoval Mountains, Anthony Island and the west coast.

1) East Coast of Moresby Island

The waters of the east coast of Moresby Island and the smaller adjacent offshore islands are sheltered and readily accessible. They provide the most diverse recreational opportunities and presently this area receives the most visitors.

The area's irregular coastline provides many campsites and small anchorages, often in picturesque inlets and bays or among groups of small islands. At the heads of most inlets and bays are grassy meadows and estuaries which form wherever small streams meet the sea. Virtually every stream in the area rears a population of coho salmon, trout and Dolly Varden. During the late summer recreationists can watch as seals, sealions, otter, black bear and bald eagles gather to feed on the salmon as they spawn. Along the valley bottoms and gentle slopes of these watersheds majestic specimens of Sitka spruce, red cedar, and western hemlock can be found.

The smaller offshore islands of the east coast are exceptionally scenic and are summer home to a concentration of nesting birds - bald eagles, peregrine falcons, burrow nesting seabirds by the thousands, black oystercatchers, glaucous winged gulls, other water birds and many types of forest birds. The rocks and intertidal zones support a profusion of marine life, including Canada's largest sea lion rookery. The opportunities for snorkel and scuba diving, and ocean kayaking are excellent. The intertidal and offshore areas around the islands are abundant in abalone, mussels, rock scallops, clams, rock cod, halibut and other bottom fish.

Hotspring Island (16 hectares) in Juan Perez Sound is a focal point of recreation in South Moresby. It is named for its near-boiling mineral springs. Over the years residents and visitors have devised a series of tubs and pools, each with its own particular view of Juan Perez Sound. The adjacent islands - Murchison, Ramsay and House - provide a variety of birdlife, rock cliffs, caves and intertidal areas within a few minutes from a base camp on Hotspring. The Island is visited by dozens of people every day of the summer season and used frequently in other seasons by fishermen and food gatherers.

For many visitors to South Moresby the rich cultural history of the Haida is a compelling and rewarding attraction. Tanu, Windy Bay, Benjamin Point, Burnaby Narrows, Scudder Point and Bolkus Islands are sites where remnants of Haida villages and camps are still evident. In addition to abandoned villages, evidence of aboriginal use of land is widespread. Salmon fishing weirs and middens are present near most streams and estuaries.

There are numerous examples of more recent use of the land. Along the east coast lie the rusting engines, boilers and crumbling brick foundations of abondoned mine sites at East Copper Island and Ikeda, and the old whaling station at Rose Harbour. The mine works of Francis Poole, the first white settler on the Charlottes, are visible on the east coast of Burnaby Island.

Wildlife is abundant in the waters and along the shores of the east coast. Visitors can see and photograph seals and their pups, sealions and occasionally whales, purpoises and dolphins. Many shorebirds and waterfowl are common along the shoreline. Blacktail deer and black bears are often seen feeding on the beaches.

The beaches are a jumble of driftwood and flotsam. Along the north coast of Burnaby Island, around Benjamin Point and on any small beach, explorers can spend hours searching the driftline for glass balls, Japanese bottles and other collectable treasures.

2) The San Christoval Mountains

The San Christoval Mountains rise nearly 1,200 metres above sea level and are snow capped for most of the year. They provide a jagged and spectacular background to the ocean shoreline and offshore islands of the east and west coast. Most of the peaks are bare rock, and alpine vegetation extends down nearly to sea level in several inlets. Some of the biologically unique plant species on the Charlottes grow in these alpine areas surrounded by dwarf "bonsai" lodgepole pine trees, sphagnum moss and bog flowers.

The San Christoval Mountains rise steeply out of the water, particularly in the Darwin Sound area, and create climatic conditions that can be completely different than the outer east coast islands. The peaks catch rain clouds and often in summer produce mists and fine rain that create the magical "misty islands" image for which the Queen Charlottes are famous.

Virtually all of the peaks are within five kilometres of either coastline and most can be reached in several hours of hiking following old trails used by the Haidas and early prospectors. From the peaks, the visitor enjoys a panoramic view out to the open Pacific to the west, over the islands to the east and down the length of Moresby Island. The hiker can traverse from a marine environment, through a coastal rain forest and up into an alpine zone within a very short time. The area contains many alpine lakes, some with white sandy beaches and cascading waterfalls.

The continuity of terrain from peak to peak provides some opportunity for a north-south alpine hiking route (approximately 60 kilometres long) along the length of Moresby Island. Portions of this route are being used by hikers and naturalists at the present time.

3) Anthony Island

Anthony Island (140 hectares) has been a provincial park since 1956 and was declared a World Cultural Heritage Site by the United Nations Scientific and Cultural Organization (UNESCO) in 1982. It contains the finest collection of totem poles in their original setting on the Pacific Coast of Canada.

The island of Skungwai, home of Chief Nunstins, was a busy place in the early days of European contact on the Charlottes. Trading ships seeking sea otter pelts anchored in the bay. When Skungwai was abandoned in 1883, the totem poles and long houses were left standing along the shore of a beautiful sheltered beach. Although the inhabitants have gone, Skungwai is alive with memories of another era and way of life. Every visitor feels the powerful presence of an ancient culture in this magnificent and remote setting. Anthony Island has become the prime attraction for visitors to South Moresby.

The islets around Anthony Island have all been granted Ecological Reserve status to protect the prolific colonies of auklets, petrels, gulls and the rich variety of marine flora and fauna. The exposed west coast of these islets is in sharp contrast to the sheltered bay of the village of Skungwai and is one of the few places in Canada where horned puffins can be seen. The scenic spruce forest, the seascapes, the marine life and the birds of Anthony Island and Louscoone Inlet area to the immediate north are a paradise for naturalists, photographers, artists and sightseers. The Island is attended by a Haida watchman.

4) Westcoast of Moresby Island

The west coast of Moresby and Kunghit Islands is rugged and access is often difficult because of exposure to the weather and waves of the open Pacific. The shoreline is mostly a wall of bare rocky cliffs, pounded relentlessly by huge waves and topped with windswept forests. It is exceptionally scenic with many rock pinnacles, cliffs and a dramatic shoreline.

Several inlets break the outer shoreline and the skilled boater can enter through narrow entrances into peaceful sheltered bays for safe anchorage. Some of these bays and inlets are quite similar to the east coast with sandy beaches, streams and estuaries, grassy meadows and lagoons set against the rugged peaks of the San Christovals. Access to the forest and mountains is easy from these inlets where the alpine begins near sea level.

As on the east coast, the west coast bays and inlets show much evidence of habitation by the Haidas. Gowgaia Bay, one of the larger inlets, has five known Haida village sites and is the start of an old Haida trail to Hutton Inlet on the east coast. The diversity of wildlife, birds and marine mammals on the west coast is similar to the more sheltered east coast.

The west coast remains largely unvisited by recreationists or even by professionals doing scientific studies. It does, however, provide a wild and scenic recreational experience in a formidable wilderness environment and is expected to see increasing recreational use in the future. However, only the very experienced should travel by small boat to the west coast.

3.3.4 ECONOMIC VALUE OF RECREATION

The measurement of the economic value of recreation in the study area is subject to limitations. The commercial charter value is partially recorded through an association of tour operators and enough information exists on non-commercial expenditure elsewhere in the province to allow rough estimates to be made. The figures available are sketchy but provide a conservative estimate of current activity. Direct expenditures by commercial recreationists taking a trip to South Moresby Island in 1982 are estimated at $632,000. The average direct expenditure by the 482 commercially guided visitors to Moresby Island in 1982 was $1,300 per visitor. As a direct result at least 40 persons were employed full time and an additional five to 10 were employed part-time by commercial recreational operators during their preparation and operating season (McPhee, 1983).

Based upon experience elsewhere in the province it has been estimated that direct expenditures by non-commercial recreationists visiting the study area in 1982 ranged from $70,000 to $100,000. The average direct expenditure by the 250 to 350 non-commercial visitors has been estimated at $285 per visitor. Considering the travel involved in getting to and then touring South Moresby, this estimate is likely to be very conservative. Based upon similar data elsewhere in the province it has been estimated that this expenditure generated seven to 10 seasonal jobs.

In total, approximately $730,000 was spent directly for recreational trips to the South Moresby study area in 1982 and this expenditure generated approximately 55 seasonal jobs. This expenditure represents approximately .05 percent of the total tourism expenditure for the province for that year.

It is recognized that direct expenditures generate additional economic activity through the supply of goods and services to commercial ventures, and by the expenditures of persons employed. This additional activity is often referred to as the multiplier effect. In the absence of firm knowledge concerning the relationship between direct and indirect and/or induced expenditures, the level of economic activity arising through the multiplier has not been quantified. However, its existence in some form is well-documented and should be considered in evaluating commercial potential.

The importance of recreation and tourism in the provincial economy has been increasing in recent years. A recent economic analysis of British Columbia (B.C. Central Credit Union, 1983) has found that in the last 20 years more than 80 percent of the new jobs created in the province have been in the tourism and services sector. This sector is now the largest employer in the province. The report states that future growth of the provincial economy depends on the creation of new jobs and it is the tourism industry which appears to offer the best potential for expansion and job creation. The authors expect tourism will be the number one industry in B.C. within 10 years.

The economic value of recreation in South Moresby must be seen in this context. It has shown rapid growth in the past few years and appears to have the considerable potential for growth and job creation in future.

3.4 Native Food Fishery

Marine resources continue to be the mainstay of the Haida nation. A healthy environment serves as a food bank and during hard times, dependancy upon food resources increases. Most fin and shellfish, as well as herring roe and seaweed, comprise a vital part of the Haida diet. Important Haida food fishery areas are directly apportioned to natural abundance. The Haida food harvest is a natural element in South Moresby.

3.5 Commercial Fishery

Commercial fisheries in the marine waters adjacent to South Moresby are regulated and managed by the Federal Department of Fisheries and Oceans. South Moresby lies within the Queen Charlotte District and is included within the boundaries of Fisheries subdistricts 2-East (eastern Moresby Island) and 2-West (western Moresby Island). Resource and management data are generally related to these statistical subdistrict areas. The resource information provided in this section reflects only that portion of the fishery activities within South Moresby. To accomplish this apportionment, it was necessary to make estimates of the percentage of subdistrict resources within South Moresby.

In general, the fisheries adjacent to South Moresby comprise a significant portion of the total harvest of the Queen Charlotte District. The bulk of the Queen Charlotte abalone fishery is taken there. The South Moresby salmon harvest accounts for approximately 30 percent of the district catch, the latter area representing 12 percent of the (1980) total B.C. coastal salmon catch. In addition, the herring catch from South Moresby typically represents approximately 80 percent of the total District catch, with the latter area having contributed 18 percent of the B.C. coastal herring catch for 1980.

3.5.1 COMMERCIAL SALMON

Coho, chum and pink salmon are widely distributed throughout the streams of South Moresby. Coho are caught commercially by troll, seine and gillnet gear from June to September. Pink and chum salmon are caught from June to early October by gillnet and seine gear as they approach the spawning streams. Passing stocks of chinook salmon are commercially taken by trollers in the water adjacent to South Moresby.

An index of salmon spawning streams and average numbers of returning fish is provided in Table 5. Numbered index streams on Table 5 are referenced to numbered streams on Figure 11. Catch figures for the period of 1972 to 1982 are provided in Table 6.

3.5.2 INVERTEBRATE SPECIES

Historically, important areas of butter clam harvest include Dolomite Narrows and south into Skincuttle Inlet (see Figure 12). Commercial harvesting of this species is prohibited from time to time due to paralytic shellfish poisoning (PSP), but this does not imply a permanent alienation from harvesting.

Principal areas of harvest for geoduck clams are outside of South Moresby, however minor catches have been reported in southern locations where significant stocks are suspected.

Pink shrimp are harvested typically by traps as well as by otter or beam trawling mainly in Juan Perez Sound. Commercial interest has only recently been directed in this area for this species. As such, fishing areas and patterns are not well-defined.

Abalone are widely distributed throughout the rocky shoreline areas of southern Moresby Island and are now mainly harvested by scuba diving methods. Approximately four to six vessels operating under permit quotas harvest the waters of South Moresby. During the period 1976 to 1980, the total abalone harvest from around Moresby Island was 510 metric tons or 37 percent of the B.C. coastal total. These figures include harvest from the areas of Cumshewa and Selwyn Inlets which are outside of South Moresby. However, since 1980 the harvest has been considerably reduced.

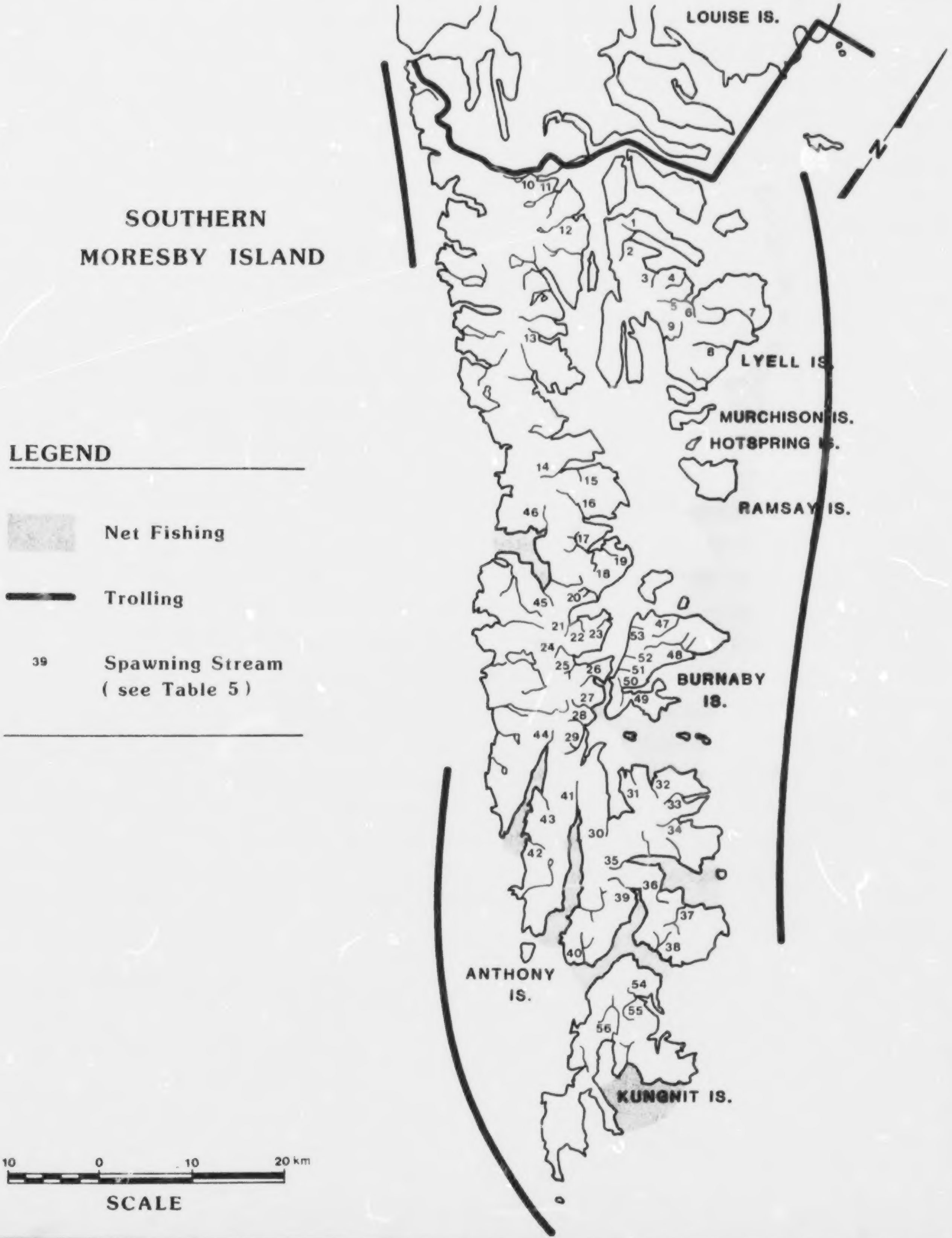
Red sea urchin and giant sea cucumber are also widely distributed in South Moresby and have a potential commercial significance. Although minor catches have been taken in other areas of B.C., no commercial fishery currently exists for these two species in South Moresby.

Shellfish Closures

In 1974, the Queen Charlotte District recommended closure of the commercial harvest of abalone in upper Juan Perez Sound. The closure was intended to create a recreational reserve for the harvest of abalone. In 1979 the area was expanded into Skincuttle Inlet and Carpenter Bay for conservation purposes. In 1983, the latter two areas were re-opened for the commercial harvest of identified surplus stocks.

An outbreak of PSP in mid-June of 1963 resulted in the current recreational closure on bivalve molluscs along the entire coast between Cape Caution and the Alaskan Border, including the entire Queen Charlotte Islands.

Figure 11 IMPORTANT SALMON HARVEST AREAS AND INDEX OF SALMON SPAWING STREAMS


SOUTHERN MORESBY ISLAND
LEGEND
▨ Net Fishing
Trolling
39 Spawning Stream (see Table 5)
10 0 10 20 km
SCALE
N
LOUISE IS.
LYELL IS.
MURCHISON IS.
HOTSPRING IS.
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BURNABY IS.
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TABLE 5: Index of Salmon Spawning Streams

No.	Creek Name	Length of Spawning/ Rearing (km)	Average Yearly Returning Adults (Even years) Pink	Average Yearly Returning Adults (6-year Avg.) Chum	Average Yearly Returning Adults Coho[1]
LYELL ISLAND					
1.	Moore	0.7 km	-	1,400	+
2.	Takelly	0.1	-	20	+
3.	Beljay Bay	0.8	10	90	+
4.	Sandy	2.5	-	900	+
5.	Powrivco	2.5	20	2,200	+
6.	Richardson	0.5	20	450	+
7.	Windy Bay	6.5	56,700	(50)[2]	+
8.	Gate	2.0	17,600	50	+
9.	Sedgwick	0.8	20	3,200	+
MORESBY ISLAND–CENTRAL					
10.	Anna Inlet	0.4	1,000	100	+
11.	Salmon River[3]	2.4	15,800	5,100	+
12.	Echo Harbour	3.0	11,700	40	+
13.	Kostan	0.6	280	120	+
14.	Hutton Inlet (at head)	2.4	8,800	100	+
15.	Hutton Inlet (So. side)	0.8	900	60	+
16.	Marshall Inlet	2.0	5,400	200	+
17.	Matheson Inlet (NW)	0.8	13,000	250	+
18.	Matheson Inlet (SW)	1.0	24,300	150	+
19.	Arrow	0.3	200	150	+
20.	Skatt Harbour (NW)	0.4	-	120	+
21.	Skatt Harbour (So)	1.2	-	300	+
22.	Skatt Harbour (SE)	1.0	(100)[2]	1,200	+
MORESBY ISLAND–SOUTH					
23.	Forgotten	0.6	(50)[2]	600	+
24.	Island Bay (W)	0.8	-	650	+
25.	Island Bay (SW)	1.6	-	350	+
26.	Bag Harbour	2.4	(1,400)[2]	9,800	+
27.	Tangle	1.6	100	650	+
28.	George Bay	3.2	3,300	2,300	+
29.	Slim Inlet	1.6	1,700	4,100	+
30.	Huston Inlet	0.8	(50)[2]	2,650	+
31.	Jedway	0.4	-	670	+
32.	Harriet	0.8	250	3,300	+
33.	Ikeda	2.5	-	1,450	+
34.	Collison Bay	0.8	(50)[2]	500	+
35.	Carpenter Bay	0.5	430	950	+
36.	South Cove	0.8	(50)[2]	600	+
37.	Kova	1.6	(4,800)[2]	550	+
38.	Raspberry	1.5	(250)[2]	100	+
39.	Sedmond	1.2	700	3,750	+
MORESBY ISLAND–WEST					
40.	Fanny	0.4	-	(100)[2]	+
41.	Louscoone Inlet	2.5	(1,000)[2]	1,800	+
42.	Sperm Bay	1.6	-	520	+
43.	Staki	0.8	(100)[2]	950	+
44.	Flamingo	1.2	(100)[2]	2,800	+
45.	Yakulanas	1.0	-	1,200	-
46.	Goski	3.1	-	480	-
BURNABY ISLAND					
47.	Alder Island	0.4	3,250	800	+
48.	Scudder Point	2.5	27,300	120	+
49.	Poole Inlet (So)	0.2	-	400	+
50.	Poole Inlet (West)	0.2	-	(250)[2]	+
51.	Burnaby Narrows (#1)	0.1	-	50	+
52.	Burnaby Narrows (#2)	0.1	-	100	+
53.	Marker	0.7	-	220	+
KUNGIT ISLAND					
54.	Moody	1.2	-	(100)[2]	+
55.	Heater	1.2	-	900	+
56.	Luxana	1.5	(50)[2]	10	+
			200,720	59,010	

[1] Coho timing does not coincide with enumeration of other salmon species. Therefore adult counts are not reliable. (+ = present : - = not observed)

[2] Returns are low and/or highly variable. Figures provided have low reliability.

[3] Incidental sockeye observations.

TABLE 6: Commercial Salmon Harvest - South Moresby Study Area

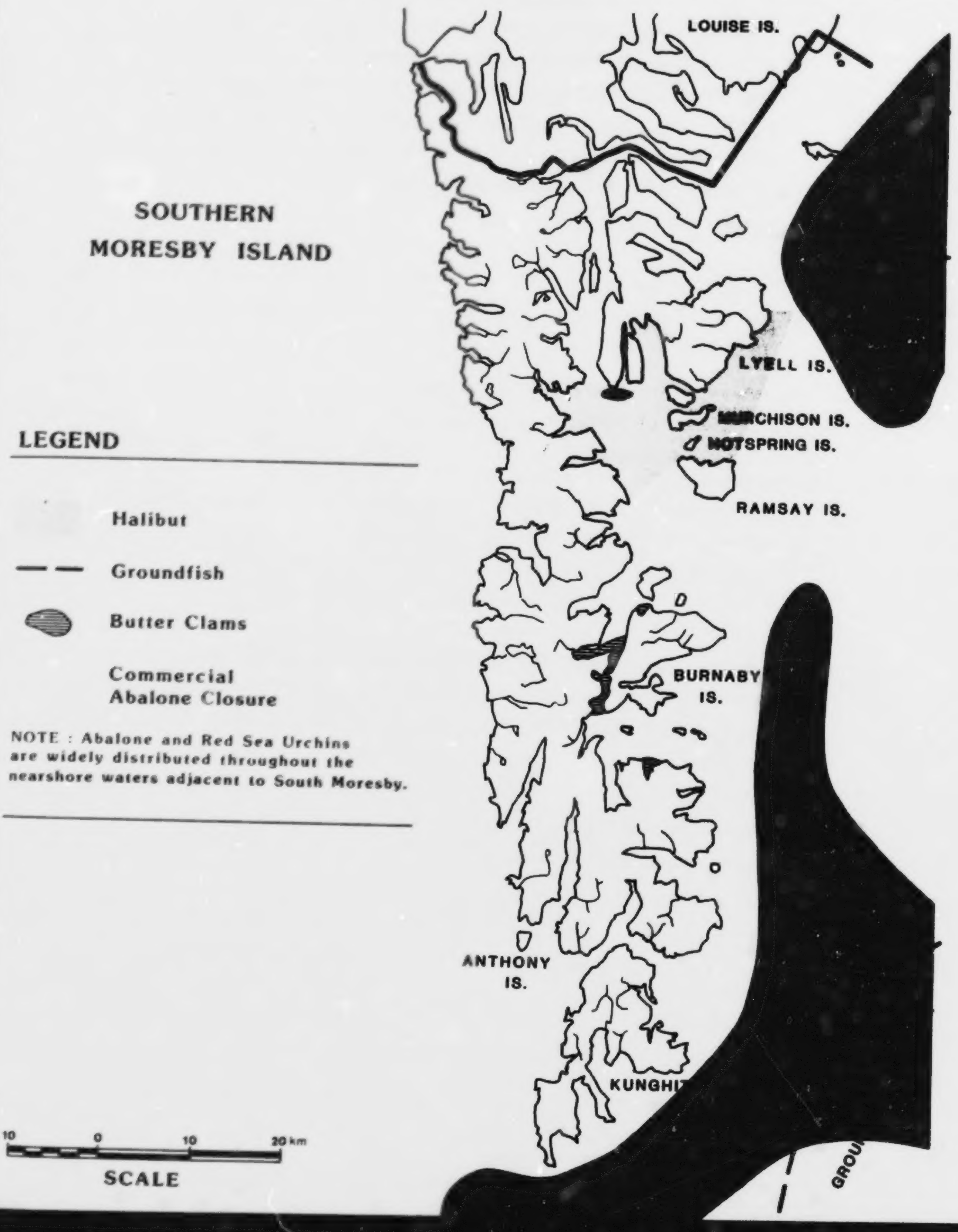
Year		Pink		Chum		Coho		Sockeye		Chinook		Steelhead		Boat Days	
		net	troll	net	troll	net	troll	net	troll	net	troll	net	troll	net	troll
1972	weight[1]	600k[2]	32150	990k	1800	31k	425960		900		189300	combined			
	pieces	150k	8040	110k	200	3700	53425	nil	180	nil	13500	10		635	1760
1973	weight	nil	5200	1400k	2700	24k	230400		150		140000				
	pieces	nil	1300	157k	300	3100	28800	nil	30	nil	10000	2		510	1345
1974	weight	800k	6970	460k	2500	9k	263160		9700		428400				
	pieces	200k	1740	51k	270	1100	32900	nil	1940	nil	30600	9		578	1520
1975	weight		5880	130k	900	2k	143600		125		212800				
	pieces	nil	1470	3k	90	200	17950	nil	25	nil	15200	20		82	1590
1976	weight	1200k	6130	99k	300	80k	486700		350		257600				
	pieces	300k	1540	11k	30	10k	60840	nil	70	nil	18400	8		222	2190
1977	weight		9360	1430k	2125	24k	100470		760		205800				
	pieces	nil	2340	159k	235	3k	12600	nil	150	nil	14700	31		508	1720
1978	weight	165k	21570		4320	8k	423570		5145		208600				
	pieces	45k	5390	nil	480	1k	52950	nil	1030	nil	14900	6		210	2070
1979	weight		51400		5800		317000		1400		210000				
	pieces	nil	12840	nil	645	nil	39640	nil	280	nil	15000	8		nil	800
1980	weight		89500	450k	6750	33k	480250		1570		250600				
	pieces	nil	22370	51k	750	44k	51030	nil	315	nil	17900	31		259	3900
Averege Catch in Pieces 72-80		77k	6336	60k	333	3k	38834	nil	447	nil	16700			14	

[1] Weight (lbs)

Note: Troll catches are estimated from total area catch. There is no net catch for pinks in West Moresby and 80% of the chum catch is from East Moresby. Net fisheries in the planning area are directed on Pink and Chum stocks. Trollers operate throughout the planning area. Historical areas for salmon net fisheries are Darwin Sound, Juan Perez Sound, Skincuttle Inlet, Flamingo Inlet and Louscoone Inlets.

k = 1,000's

Figure 12 HALIBUT, GROUNDFISHERY AND INVERTEBRATE AREAS


SOUTHERN
MORESBY ISLAND
LEGEND
Halibut
— — Groundfish
Butter Clams
Commercial
Abalone Closure
LOUISE IS.
LYELL IS.
MURCHISON IS.
HOTSPRING IS.
RAMSAY IS.
BURNABY IS.
ANTHONY IS.
KUNGHI
GROU
10 0 10 20 km
SCALE

NOTE : Abalone and Red Sea Urchins are widely distributed throughout the nearshore waters adjacent to South Moresby.

3.5.3 GROUNDFISH AND HALIBUT

Two trawl and longline areas for the ground fishery in the waters adjacent to South Moresby are shown on Figure 12. These include the area of Reef Island (Pacific cod, rock sole, lingcod) and Moresby Gully (Pacific Ocean perch, lingcod). The yearly harvest of groundfish from Hecate Strait is listed on Table 7. Sport fishermen often take lingcod in nearshore waters by line or spear methods. Lingcod are also taken commercially by troll.

Halibut longlining areas are also shown on Figure 12, indicating those regions of highest intensity. Annual halibut harvests are listed on Table 7.

3.5.4 HERRING

Herring stocks produce a major commercial fishery for extracted herring roe, roe on kelp and food/bait industries. Approximately 16 percent (four-year average) of the roe catch from coastal B.C. comes from the South Moresby. Tonnages for commercial herring harvest from South Moresby are presented in Table 8.

Herring are taken by net fishing as they concentrate for spawning which generally occurs on marine algae in protected waters during March and April. Herring roe on kelp may be collected in herring impoundments following spawning. Historical areas for roe on kelp impoundments include Atli Inlet, Section Cove, Slim Inlet and Jedway Bay. Free-floating kelp impoundments may operate throughout the spawn areas indicated on Figure 13.

TABLE 7: Halibut and Groundfish Harvest - Subdistrict 2-West and 2-East

							Boat Days Fishing	
Year	Halibut	Sole	Rockfish	Ling Cod	Grey Cod	Black Cod	Line	Trawl
1972	288	-	1	8	-	29	1771	-
1973	1708	223	25	63	1348	257	3102	209
1974	1167	468	50	72	1470	116	2252	284
1975	1311	666	74	70	1038	30	2759	395
1976	1513	504	184	57	1216	171	4108	412
1977	1238	586	3333	36	577	118	6351	478
1978	1174	499	4315	33	619	283	3232	544
1979	1070	854	2285	54	1385	563	3515	648
1980	1242	941	3649	63	1084	646	4088	775

Ground fish are taken from a broad area and catch is not always separated between subdistricts. Therefore these figures indicate the harvest from the general areas of Hecate Strait and Pacific Ocean which are adjacent to Moresby Island.

Figures are listed in metric tons.

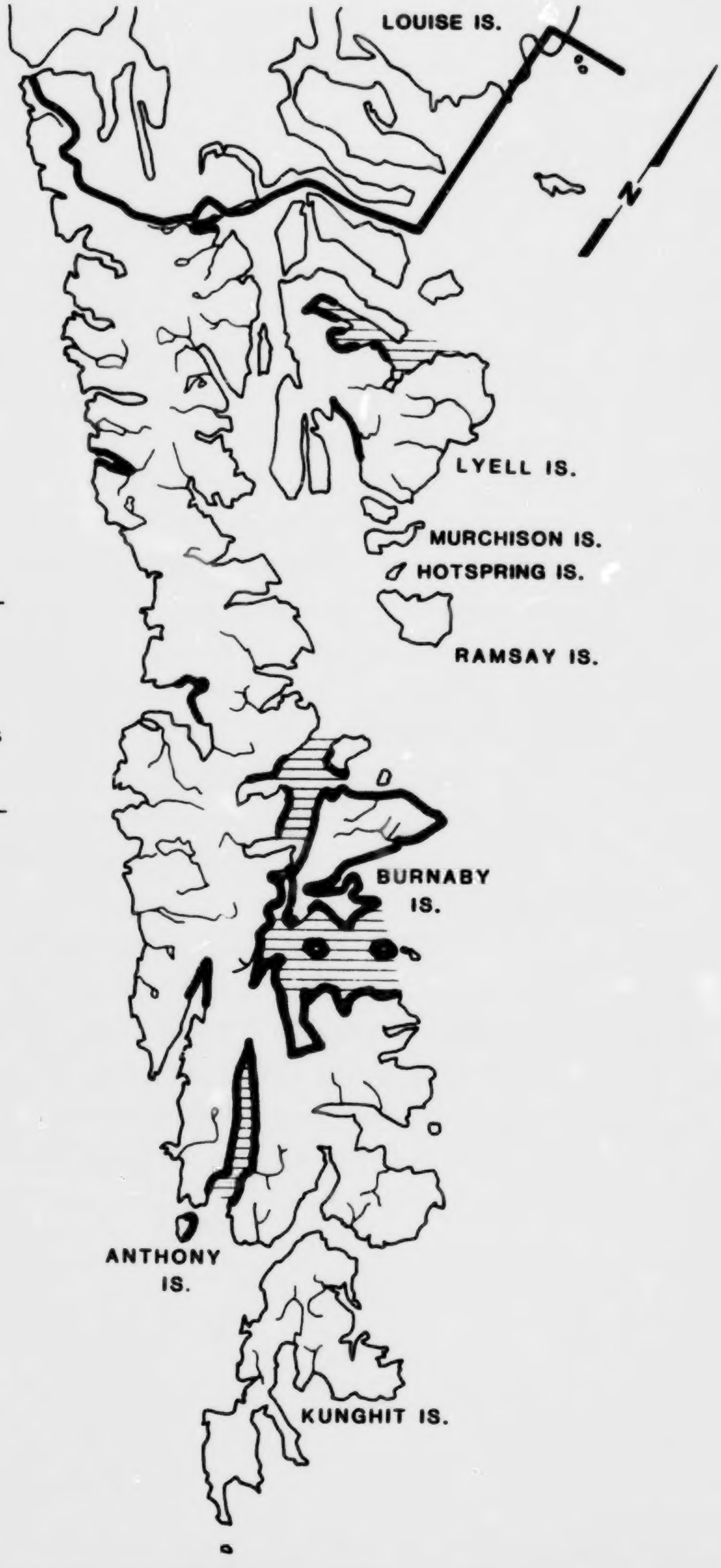
TABLE 8: Commercial Herring Net Harvest

		Metric Tonnage by Gear Type		Spawn Standard
Year	Deliveries	Seine	Set Net	Square Yard
1972	57	4120	0	(-)[1]
1973	116	8510	0	-
1974	209	7600	127	-
1975	120	9110	115	-
1976	778	12570	1850	-
1977	625	11830	1520	310,360
1978	806	9710	1890	533,510
1979	1196	6100	2780	330,840
1980	531	2420	1320	946,040

[1] Information not collected prior to 1977.

Figure 13 HERRING SPAWN DISTRIBUTION AND IMPORTANT HERRING FISHERY AREAS

SOUTHERN
MORESBY ISLAND


LOUISE IS.
N
LYELL IS.
MURCHISON IS.
HOTSPRING IS.
RAMSAY IS.
BURNABY IS.
ANTHONY IS.
KUNGHIT IS.

LEGEND

▬	Historical Spawn Areas
▤	Herring Net Fishery Areas

10 0 10 20 km

SCALE

Currently 541 area seine and gillnet roe herring licences and 11 herring spawn on kelp permits have been issued for B.C. coastal waters north of Cape Caution. This represents 35 percent of the total coastal herring licences issued.

3.6 Timber

The commercial forests of the South Moresby are predominantly old-growth climax communities restricted to a few major species. The major commercial coniferous species are western hemlock (50 percent) western red cedar (25 percent), Sitka spruce (20 percent), and yellow cedar (five percent). Minor species include mountain hemlock, shore pine, and occasionally, western yew.

The ecological characteristics of the South Moresby forest communities are described in Section 3.1.3. The prime commercial forests are found in the Coastal Western Hemlock (CWHg) subzone, associated with the east coast islands (Lyell, Burnaby) and the extreme eastern edge of Moresby Island. The most productive forests are therefore contained within T.F.L. 24. The CWHg make a transition to the less productive Coastal Cedar Pine Hemlock zone (CCPH) to the west and on the southern tip of Moresby Island (Banner et. al., 1983), areas which are predominantly T.S.A. land. For this reason timber harvesting and forest management activities in South Moresby have been, historically and in recent times, concentrated on lands which are part of T.F.L. 24.

The contract operation for T.F.L. 24 on Lyell Island is currently the sole harvesting operation in South Moresby. The operation moved to Lyell from Talunkwan Island in 1975. The previous years from 1948 to 1974 were inactive except for minor handlogging sales in the T.S.A. portion. During this period the areas logged by A-frame regenerated naturally and are now 30- to 50-year forests, restoring to some extent the wilderness landscape of South Moresby.

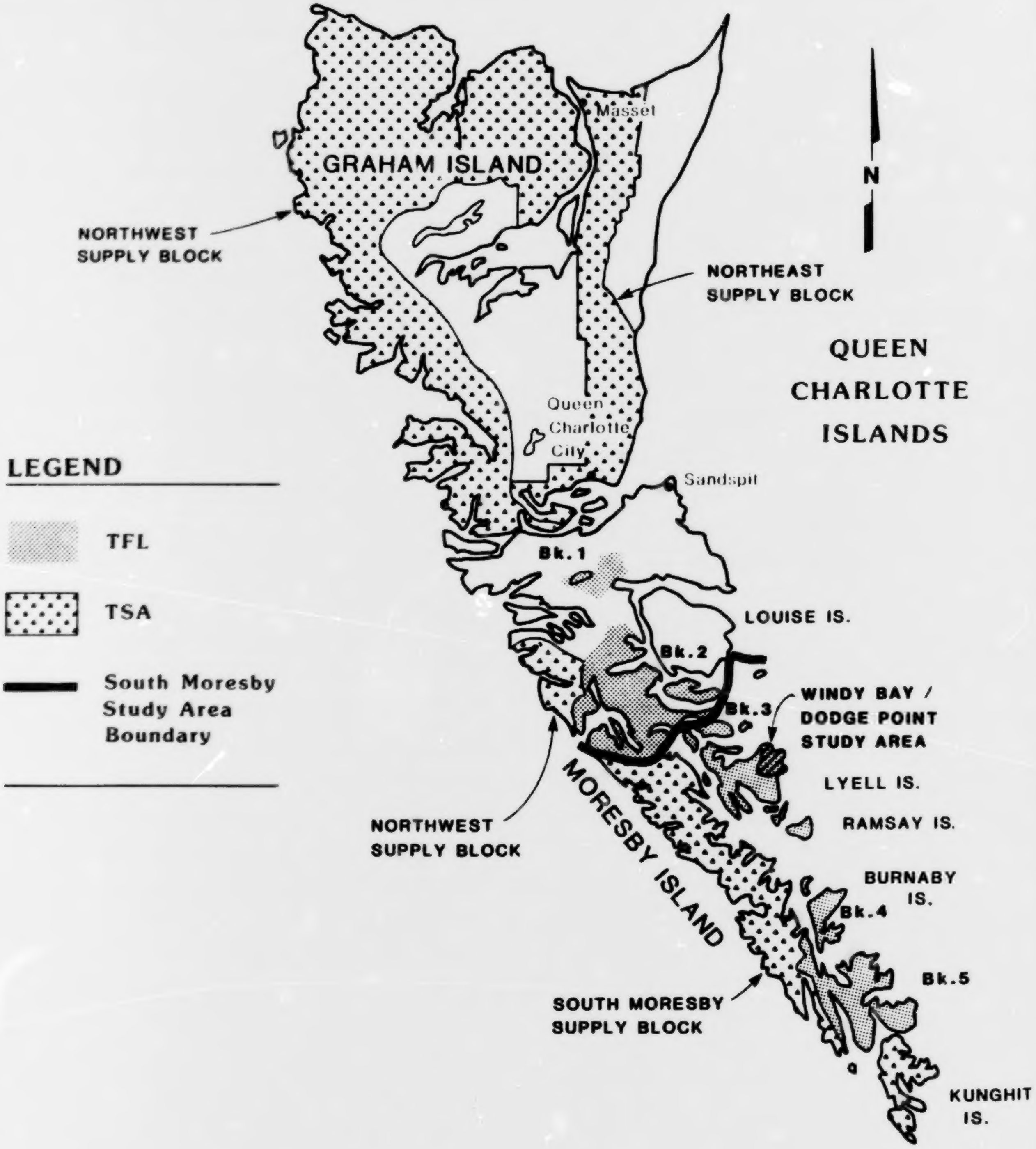
The Lyell Island operation removes approximately 200 000 m^3 from some 230 ha. of forest land annually. As with most Queen Charlotte operations, logging is accomplished by clearcutting using conventional high-lead systems or short grapple yarding. Logs are scaled, sorted and watered at Powrivco Bay and barged to the lower mainland or Vancouver Island.

3.6.1 FOREST LAND BASE

Forested land in the study area is contained almost exclusively within the two major forest management units, T.F.L. 24 and the Queen Charlotte T.S.A., shown in Figure 14. These units are extensive and encompass additional areas on the Queen Charlotte Islands lying to the north of the study area boundary. The southern Blocks 3, 4 and 5 of T.F.L. 24 are wholly within South Moresby and account for 50 percent of the total land base of that licence. The South Moresby boundary similarly separates the South Moresby Supply Block (SMSB) from the Northeast and Northwest Supply Blocks of the Queen Charlotte T.S.A. The South Moresby Supply Block represents 22 percent of the total land base of the T.S.A.

The T.S.A. and T.F.L. lands in the South Moresby together total 143 000 ha, or 99 percent of the total study area. A further 980 ha are in Timber Licences held by MacMillan Bloedel, shown in Figure 3. These old temporary tenures confer cutting rights to mature timber in Crown land which are extinguished following logging. Timber Licences are therefore a minor form of tenure and do not constitute sustained yield units in themselves. The remaining 382 ha., or .3 percent, of forest land is formally alienated from industrial use through ecological reserve, provincial park, or private land status.

Figure 14 DIVISIONS OF TREE FARM LICENSE 24 AND QUEEN CHARLOTTE TIMBER SUPPLY AREA


GRAHAM ISLAND
Masset
N
NORTHWEST SUPPLY BLOCK
NORTHEAST SUPPLY BLOCK
QUEEN CHARLOTTE ISLANDS
Queen Charlotte City
Sandspit
LEGEND
TFL
TSA
South Moresby Study Area Boundary
Bk. 1
Bk. 2
Bk. 3
LOUISE IS.
WINDY BAY / DODGE POINT STUDY AREA
LYELL IS.
RAMSAY IS.
MORESBY ISLAND
NORTHWEST SUPPLY BLOCK
BURNABY IS.
Bk. 4
Bk. 5
SOUTH MORESBY SUPPLY BLOCK
KUNGHIT IS.

The total forest land base is subdivided into various components, as summarized in Table 9. Non-productive areas and non-merchantable stands are deducted from the total land base to determine total productive forest land. Productive forest land is then further subdivided into mature, immature and Not Satisfactorily Restocked (NSR) categories.

Further deductions are made from the productive forest land base in recognition of areas which are not harvestable for environmental, technological or economic reasons. This process establishes the net operable area, also indicated in Table 9.

The operability study undertaken by the licensee during preparation of Management and Working Plan No. 5 provided deductions for T.F.L. 24. The methodology for this study was developed jointly by Western Forest Products Ltd. and Ministry of Forests personnel. The basis for defining environmental and technological inoperability on a site specific basis in this study area required a combination of ecological classification, operability mapping, and concepts derived from the Ministry of Forests environmental protection assessments. The project detailed logging methods that could be reconciled with the degree of sensitivity and provides a basis for forest development. T.F.L. 24 was the first management area in B.C. to be mapped at this level of detail.

The classification process for T.S.A. lands in South Moresby has been less detailed than that for the T.F.L. This is due in part to the relatively fewer harvesting opportunities in this portion of the study area. The Unit Survey of 1967 has provided the basic inventory information for the T.S.A. The Ministry of Forests undertook a further classification to identify areas potentially sensitive to logging. These units are referred to as Environmentally Sensitive Areas (E.S.A.'s).

Each E.S.A. area is mapped using standard criteria to predict the impact of environmental constraints on potential timber supply. Depending on the degree of sensitivity, E.S.A.'s are subject to various reduction factors which decrease their contribution to the yield of the T.S.A. The lines delineating these areas are flexible; at the time of inventory they reflect the environmental, technological, social and economic constraints in force and projected in the foreseeable future. All E.S.A. boundaries are reviewed during subsequent surveys. In South Moresby, E.S.A. units emphasize areas with sensitive or problem soils, recreational potential, or important fish and wildlife habitat. In addition, stands which are considered technologically/economically unavailable for reasons other than environmental sensitivity have been designated as inoperable.

The cumulative result of these efforts to determine the net operable timber supply indicates that 20 percent of the total productive forest land overall may be considered available for timber harvest, as shown in Table 9. The distribution of net operable area is illustrated in Figure 15. Of the 33 250 ha. of net operable forest in South Moresby, fully 30 000 ha. or 90 percent is located within the T.F.L. In contrast, the South Moresby Supply Block accounts for seven percent of the net operable lands in South Moresby.

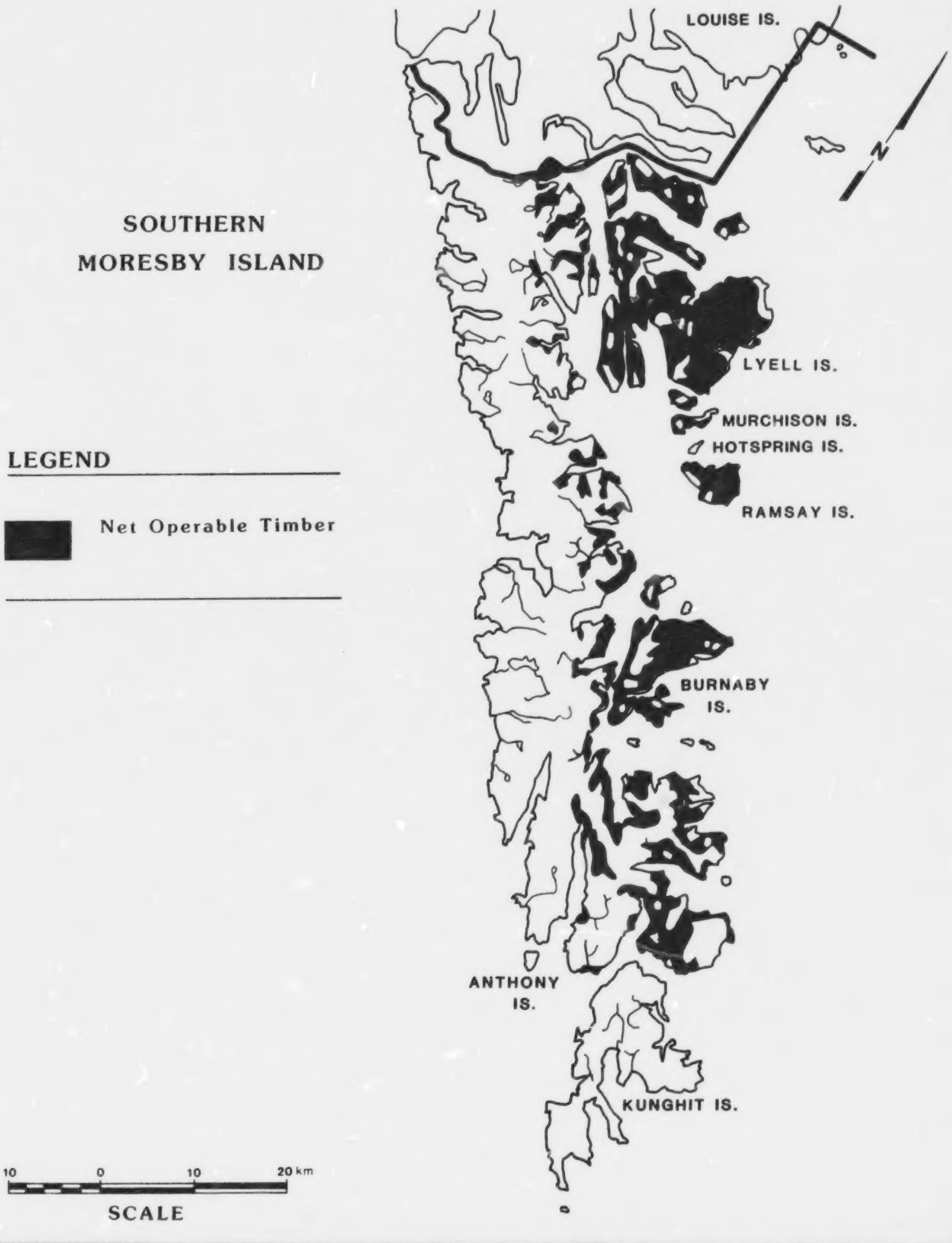
The volumes of timber associated with productive forest and net operable land areas are also summarized in Table 9. The total volume of mature forest has been determined to be 44 839 500 m^3. Of this volume 45% or almost 20 000 000 m^3 is on net operable forest land. Ninety-four percent of this volume is in the Tree Farm Licence.

TABLE 9: Forest Land Area/Volume Summary

	Area (ha.)			
	TFL 24 Blocks 3,4,5	TSA SMSB	MB TL's	Grand Total
Total	56 168	86 900	980	144 048
Non-Productive	16 803	30 880	49	47 732
Productive Forest	39 365	56 020	931	96 316
Mature	32 015	55 626	759	88 400
Immature	5 931	394	66	7 331
NSR*	479		106	585
Net Operable	30 000	2 428	825	33 253
Mature	24 069	2 428	759	27 256
Immature	5 931		66	5 997
	Volume (m^3)			
Total	23 630 000	19 944 600	533 500	44 839 500
Net Operable	17 838 900	1 441 308	533 500	19 813 708

* Not Satisfactorily Restocked

Figure 15 NET OPERABLE FOREST LAND


LOUISE IS.
N
SOUTHERN
MORESBY ISLAND
LYELL IS.
MURCHISON IS.
HOTSPRING IS.
RAMSAY IS.
LEGEND
■ Net Operable Timber
BURNABY IS.
ANTHONY IS.
KUNGHIT IS.
10
0
10
20 km
SCALE

3.6.2 RATE OF HARVEST

The net operable forest land base in South Moresby supports a rate of timber harvest which may be examined from three different perspectives. The first consideration is the actual production due to logging in the study area itself. Since the only active logging operation in South Moresby is on Lyell Island, the measure of actual production applies only to T.F.L. 24.

The second perspective is the South Moresby contribution to the rates of harvest determined for the T.F.L. and the T.S.A. The T.F.L. and the T.S.A. have a regulated rate of harvest, or Allowable Annual Cut (A.A.C.), a portion of which is due to South Moresby forest as part of these larger sustained yield units. Although the total contribution may not be taken from South Moresby itself at any given time, it is accounted for elsewhere in both the T.F.L. and the T.S.A. As a result, the measure of A.A.C. contribution may differ significantly from that of actual production.

The Timber Licences are treated in a slightly different manner because they do not have a determined rate of cut and because they expire once these volumes are cut. However, a short-term rate of harvest may be estimated, based on scheduled production over the next several decades. A second estimate has been made to relate these timber volumes over a longer term, which roughly corresponds to the contribution to A.A.C. figures described for the T.F.L. and the T.S.A.

A third perspective is the Long Run Sustained Yield (L.R.S.Y.) defined as the capability of the net operable forest land base to produce wood in perpetuity, assuming reforestation of harvested areas and no external inputs such as fertilization. L.R.S.Y. in South Moresby lies well below the contributions to A.A.C. because of the preponderance of mature timber in the area. This estimated future reduction in available timber, which is due to the transition from high-volume old-growth stands to lower-volume second-growth forests, has been termed the "fall down effect". Computer analyses show that this effect will not be experienced in T.F.L. 24 or the Queen Charlotte T.S.A. for a period of approximately 70 years. L.R.S.Y. may be calculated for all three management units; the T.F.L., T.S.A. and Timber Licences.

T.F.L. 24

The Lyell Island operaton has produced an average harvest of 225 000 m^3 over the past four years, roughly 50 percent of the total T.F.L. 24 harvest.

The T.F.L. A.A.C. and the contribution of Blocks 3, 4 and 5 are provided through the approved Management and Working Plan for the Licence. The method of calculation is based on the traditional Hanzlik formula combined with an area volume allotment check procedure as developed by the Ministry of Forests. A gross allowable annual cut of 674 357 m^3 is indicated for all mature stands with an average height of 20 metres or better and all immature stands. After providing for constraints on this gross cut, the net A.A.C. was calculated to be 460 982 m^3. Further reductions for general environmental concerns applied by the Provincial Chief Forester, and an allowance for intensive forestry, established an approved A.A.C. of 432 375 m^3 (see Table 10). Blocks 3, 4 and 5 contribute 55 percent of the total A.A.C., or 238 000 m^3 annually. The percentage is due in part to the greater proportion of mature timber relative to immature area for Blocks 3, 4 and 5 as contrasted with the two northern blocks of the T.F.L.

The technical rotation age for T.F.L. 24 is 79 years. There are approximately 60 years of mature timber available at the current harvesting rate. Of this total, Blocks 3, 4 and 5 contribute 42 years.

The L.R.S.Y. contribution for the South Moresby portion of T.F.L. 24 has been estimated to be approximately 186 000 m^3 per year, or 50 percent of the total T.F.L. L.R.S.Y.

Queen Charlotte T.S.A.

At present there is no timber harvest taking place in the South Moresby Supply Block of the T.S.A.

The current A.A.C. contribution of the South Moresby Supply block was examined in the 1982 Ministry of Forests Queen Charlotte T.S.A. Report. This yield analysis was undertaken to aid decisions regarding the A.A.C. for this unit. The yield analysis process evaluated potential harvest rates and modelled the long-term consequences of maintaining that harvest rate. The implications of reductions to the forested area, of altering the current rate of harvest, and of recognizing limitations to harvesting (E.S. and Inoperable Areas) in the T.S.A. were assessed. The effect of removing the South Moresby Supply Block from the T.S.A. while maintaining the current harvest rate was examined. The results of this scenario indicate that this withdrawal would not alter the period of time over which the current harvest could be maintained, but would result in a slightly greater falldown to L.R.S.Y. than what would otherwise be experienced.

TABLE 10: Summary of TFL 24 Allowable Annual Cut Calculation (from WFP Management and Working Plan No. 5, 1983)

	Yield (m^3)		
	Mature	Immature	Total
Gross AAC (Cu-D)			674 357
Net for alder, instability, inoperability with helicopter logging deferred	372 408 (71.4%)	149 172 (28.6%)	521 580 (100%)
Breakage	21 600	499 980	
Other losses (withdrawals, roads, impact from previously experienced slides, silvicultural losses)			38 998 460 982 m^3
Reduction for general environmental protection			28 982 432 000
Intensive Forestry Allowance			0 375
Adjusted Net AAC			432 375 m^3

Following formal review of the T.S.A. report the Chief Forester established the allowable annual cut for the Queen Charlotte T.S.A. to be 450 000 m^3 per year. This level of harvest may be sustained for approximately 70 years, stabilizing thereafter at the Long Run Sustained Yield of 255 000 m^3/year. The South Moresby Supply Block contributes approximately 11 240 m^3/year, or five percent, to the total Long Run Sustained Yield. This figure is used through the remainder of this report as an estimate of the magnitude of the rate of harvest. However, since the L.R.S.Y. calculated for the T.S.A. is less than 57 percent of the current A.A.C. for the unit, L.R.S.Y. must be considered conservative when used as an estimate of the South Moresby Supply Block rate of harvest contribution.

Timber Licences

There are four Timber Licences in the northern portion of South Moresby located on Tanu Island, Richardson Island, SW Lyell Island, and NE Lyell Island (Figure 3). No harvesting is currently taking place on these licences, but they are scheduled for harvesting from start to finish between the years 1991-2005. The periods of harvest for the individual areas range from five to nine years with corresponding harvests of 13 000 to 30 000 m^3/year. The total volume harvested to 2005 would result in an average of almost 40 000 m^3/year.

In order to combine the Timber Licence harvests with those of the T.F.L. and the T.S.A., the rate of harvest has been expressed in the similar context of a 70-year time frame. A rough calculation indicates a commensurate rate of harvest of 12 500 m^3/year over this period. It is emphasized that this figure does not reflect the actual legal and administrative arrangements affecting management practises for these areas, and is in that respect a conservative figure.

Following liquidation the Timber Licences would revert to the Crown, and the areas would subsequently contribute to the L.R.S.Y. of the T.S.A. Assuming an average mean annual increment roughly equivalent to that of T.F.L. 24, the L.R.S.Y. contribution would amount to approximately 5 700 m^3/year.

Summary

The estimates of the South Moresby rate of harvest are summarized in Table 11. Table 12 places the rate of harvest contributions for the T.F.L. and T.S.A. portion in a regional and provincial context.

TABLE 11. Summary of South Moresby Rate of Harvest Estimates

(m^3/year)

	TFL	TSA	Timber Licences	Total
Current Production	225 000			225 000
Rate of Harvest Contribution	238 000	11 200	12 500	261 700
Long Run Sustained Yield	186 000	11 200	5 700	202 900

TABLE 12. Contribution of South Moresby Rate of Harvest in Regional and Provincial Context

	(m^3/year)			(%)
	TFL	TSA	Total	South Moresby Contribution
South Moresby	225 000	11 000	236 000	100%
Queen Charlotte Islands	1 974 000	450 000	2 424 000	8%
Prince Rupert Forest Region	3 995 000	6 750 000	10 745 000	2%
British Columbia	19 500 000	47 900 000	67 400 000	0.4%

3.6.3 ECONOMIC CONSIDERATIONS

The South Moresby timber resource has an economic value which may be expressed in several ways. The current annual harvest from Lyell Island, Block 3 of T.F.L. 24, together with the contribution to harvest outside the study area, generates considerable economic activity. The licensee operations in the Queen Charlotte Islands are an example of this activity. On the strength of the T.F.L. agreement made between the licensee and the Ministry of Forests in 1958, an investment in equipment, facilities, and amenities was committed to provide a capability with which to utilize the approved allowable annual cut. The company and the contractor have invested some $10 million in camps, related facilities, dryland sorts and roads with a further $15 million invested in equipment. A total of 176 people are employed in the two operations with a total annual payroll of $7,034,000 in 1982 dollars. These investments and payments apply to the entire T.F.L., including those portions outside of the South Moresby study area.

The economic considerations of South Moresby timber may be specifically described in terms of employment income, provincial revenue, and the value of forest products. These measures represent difference economic perspectives of the available timber resource, and are presented as annual value accruing to the total rate of harvest contribution. Since these measures are separate viewpoints, they are in no way additive to each other.

Employment

The following estimate of employment attributable to the South Moresby rate of harvest contribution is limited to direct employment only. The term direct employment is applied to labour in timber harvesting and forest management on the Queen Charlotte Islands, and the processing of wood in pulpmills and sawmills located outside of the Islands. The total direct employment figure is derived from the relationship between the existing harvest and existing employment in T.F.L. 24. The direct employment figure generated represents units of employment expressed in manyears.

Local data for T.F.L. 24 for harvesting and management indicates an average production rate of 10.4 m^3 of wood harvested per manday in the T.F.L. This translates to .42 manyears for every 1 000 m^3 of harvest, assuming an average operating year of 230 days for Sewell Inlet. Employment in wood processing is related to employment in the woods in the ratio of 1:2, that is, for every woods job there are two jobs in processing, in pulping and sawmilling respectively. The direct employment from the total South Moresby harvest is summarized below:

Harvesting and Forest Management	110
Wood Processing	220
Total	330

The above harvesting and forest management employment reflects productivity in the operation which is considerably higher than the coastal average of .6 m/1000 m^3. Since the processing employment is based on a 1:2 ratio, the figures for this sector may be artificially low.

Direct employment in basic industries generates additional indirect and induced employment in the provincial economy. Indirect employment describes those jobs dependent on direct employment through the supply of goods and services. Induced employment arises through expenditures by those directly or indirectly employed, and includes such categories as professional services and retail trade. No attempt has been made to quantify this additional employment which would spin off from direct employment expenditures. The existence of the effect is nonetheless well-documented. The multiplier of 1:3 as a ratio of direct forest industry employment to total employment has been commonly applied in previous studies. This would mean that for each direct job there are two associated jobs in the province. At the local Queen Charlotte Islands level a rough multiplier of 1:1.6 could be used to estimate local indirect and induced employment.

Employment Income

A significant portion of the value of forest products is paid in wages and benefits to industry employees. The value of annual payments per employee in harvesting and processing has been determined to be \$45,963 and \$39,700 respectively, based on coastal industry average hourly wages and benefits. The harvesting employment income reflects a 230-day operating year on T.F.L. operations which is 15 percent longer than the coastal average. This works out to \$19/m^3 in harvesting and \$33/m^3 in processing when applied to T.F.L. 24. Total direct employment income from the South Moresby rate of harvest contribution is therefore \$13.6 million.

There will be additional employment income to indirect and induced employment, though no estimate of this figure has been made. The average wages for persons involved in this broad category of employment has been estimated to be roughly 80 percent of the forest industry average.

Provincial Revenue

The annual harvest from net operable forest lands contributes to provincial revenues from a number of sources. These revenues may be roughly divided into (i) payments made to the Crown as owners of the natural resource, and (ii) taxes paid to government. The former consist of stumpage, royalties and annual rents. The value of stumpage is derived as an average of T.F.L. stumpage from 1979 to 1982. The average stumpage paid for Crown timber on T.F.L. 24 during this period was $\$11.00/m^3$, or $13.37 in 1982 dollars. This figure has been applied to both the T.F.L. and T.S.A. rate of harvest contribution. A royalty value of $\$1.15/m^3$ has been calculated for the Timber Licences using weighted averages according to species composition.

The annual rent accruing to the T.F.L. portion of the rate of harvest is $.45/m^3$. It is assumed that the annual rent generated from the South Moresby Supply Block of the T.S.A. would have been derived in equal measure from timber sale licences and forest licences, with annual rents of $.10/m^3$ and $.25/m^3$ respectively. A rough average of $.15/m^3$ has therefore been applied to the T.S.A. Annual rents for the timber licences are based on area. Given the small portion of land in timber licences these total charges are nominal and have been ignored in this analysis.

Revenue from taxation of the forest industry is collected in a variety of ways. Corporate income tax is important because it is levied on returns on capital which would not be present in British Columbia in the absence of the wood supply this capital is designed to process. The logging tax is also important for this reason, and because it is a levy unique to the forest industry. During the period 1971 to 1979 corporate income taxes paid averaged $\$1.20/m^3$ in 1982 dollars, and logging taxes for the same period average $\$0.80/m^3$ in 1982 dollars.

The following table summarizes the provincial revenues per unit volume:

TABLE 13: Provincial Revenue Per m^3 Derived From Annual Harvest in South Moresby

($\$/m^3$)

	TFL	TSA	Timber Licence
Stumpage	13.37	13.37	1.15
Annual Rent	0.45	0.15	-.—
Corporate Income Tax	1.20	1.20	1.20
Logging Tax	0.80	0.80	0.80
Total	15.82	15.52	3.15

Provincial revenue due to the South Moresby rate of harvest contribution is therefore:

T.F.L.	$3,760,000
T.S.A.	$174,000
Timber Licences	$39,000
Total	$3,973,000

There are additional tax revenues in the form of corporate social service tax, employee social service tax, and personal income tax which could also be treated as revenues foregone in the event that the annual harvest is reduced. Previous estimates in 1982 dollars have been: 1.10/m^3 for corporate social service tax, \$2.00/m^3 for personal income tax, and 0.60/m^3 for employee social service tax; for a total of 3.70/m^3. If these items were to be calculated into the foregone revenue, the provincial revenue per unit volume would increase to over \$19.00/m^3. Since the effect of these additional measures are dependent on the transfer of impacts to labour, they are not considered to be as directly related to changes in timber supply as the corporate income and logging tax, and therefore have not been applied in this manner. The impacts to employment have been adequately addressed in the previous sections. However the point is made that the figure of \$15/m^3 may not capture all the revenue gained from taxation, and that a certain percentage of the employment income reported in this analysis will contribute to provincial revenue.

Value of Forest Products

Another measure of economic value is derived from the sales of final products from the forest industry. For the period 1973 to 1981 the value of products shipped by the industry was \$120/m^3 in 1982 dollars. The South Moresby harvest contribution therefore has an estimated end product value of almost \$31.4 million/year.

3.7 Mineral Resources

This section summarizes the geology of Moresby Island, past operating mines, undeveloped deposits and occurrences, current exploration activity and mineral potential. A brief economic analysis of the mineral industry is also provided. For additional technical information on the geology, mineral potential and land use in South Moresby, the reader is referred to B.C. Department of Mines Bulletin No. 54 and the South Moresby Mineral Resources Inventory and Analysis report of the Ministry of Energy, Mines and Petroleum Resources.

Mining activity has varied in intensity in the planning area for over 120 years. Two distinct periods of intense activity, 1900 to 1918 and 1953 to 1968, were accompanied by, or culminated in, mine development and production. A recent intense period of mineral exploration activity began in 1979 but is not yet at a mature enough stage to make any predictions about future production possibilities.

Geology

The geology of the Queen Charlotte Islands was first described by G.M. Dawson in 1878 and subsequently mapped in detail by Sutherland Brown of the B.C. Department of Mines from 1958 to 1963. This work continues to form the data base for all subsequent geological studies and mining exploration. Ongoing detailed investigations which involve prospecting, rock and soil sampling, and diamond drilling are carried out by mining exploration companies in their ongoing search for economic metal deposits.

Rock types ranging in age from Upper Triassic (225 million years old) to Quaternary (two million years old) are exposed in South Moresby. Volcanic rocks dominate the geology, but these are widely interspersed with fossil-bearing marine sedimenatry rocks. Granitic rocks intruded this sequence during two periods; Late Jurassic (150 million years ago) and Late Tertiary (15 million years ago).

Northwest trending faults are a prominent structural feature of the Islands and contribute to the high incidence of minor earth tremors. Faulting and folding combined with the wide variety of rock types has resulted in complex inter-relationships and a diversity of geological environment suitable for the formation of a wide range of mineral deposit types. Deposit distribution relative to fault systems is shown in Figure 16. Commodities that occur include: iron, copper, gold, silver, molybdenum, lead, zinc, vanadium and manganese.

Mines and Significant Prospects

One significant mining property, Jedway (iron), was in production from 1962 to 1968 within the study area. The Tasu mine (iron-copper-gold-silver) which operated from 1968 to 1983 is outside, but adjacent to the northwest boundary of the planning area. It is presently in the final stages of production. Minor production was also achieved in the early 1900's from a small number of deposits surrounding Skincuttle Inlet. Jedway and Tasu are both classed as metasomatic deposits. This deposit type occurs when granitic rocks intrude limestone or volcanic rocks thereby causing deposition of ore from hot, circulating, metal-rich fluids.

Jedway deposit produced 2,067,944 tonnes of iron concentrate valued at $41,399,000 (1982 constant dollars). The Tasu deposit produced over $300,000,000 of concentrate up to 1980. This was comprised of iron (9.8 million tonnes), copper (47.9 million kilograms), silver (44.6 million grams) and gold (1.2 million grams).

The recently discovered Cinola (gold) deposit on Graham Island has significant implications because similar mineralized geologic environments occur in parts of the planning area. Recent estimates indicate that the Cinola deposit contains 41 million tonnes grading 1.9 grams per tonne. If this gold is recoverable it would have a gross value of $1.35 billion. However, current indications are that the low-grade deposit is uneconomic at today's metal prices. Cinola-type deposits are characterized by low grades (typically several grams gold/per tonne), large tonnages, concentrations of quartz-rich rocks, and proximity to faults or shears.

Table 14 summarizes production, reserves, and realized or potential gross values for the former mines and undeveloped prospects. The value of minerals produced from the Moresby area in 1982 metal prices is $44.5 million and the value of known mineralization remaining in the ground is estimated to be $278 million. It is not economic to recover any of this mineralization at this time because of metal prices, grade and/or structural complexities. Table 15 summarizes the likelihood of finding further resources.

Recent Exploration Activity and Claim Status

Recent exploration has been centred mainly around Lyell Island and westerly towards Tasu. Activity is increasing in the Skincuttle Inlet area as evidenced by work documented in recent exploration assessment reports (MEMPR Report No: 9650, 9982, 10021). Preliminary surface exploration has resulted in the discovery of a number of zones of significant gold-bearing mineralization which are being tested by diamond drilling and subsurface sampling. It is expected that exploration will expand to other areas, possibly southeasterly, following the trend of deep-seated major structures and their offshoots. This will provide detailed information in parts of the planning area where little or no data for mineral deposits were previously available.

Figure 16 MAJOR FAULTS AND LINEARS SHOWING RELATIONSHIPS TO KNOWN MINERAL DEPOSITS AND OCCURRENCES

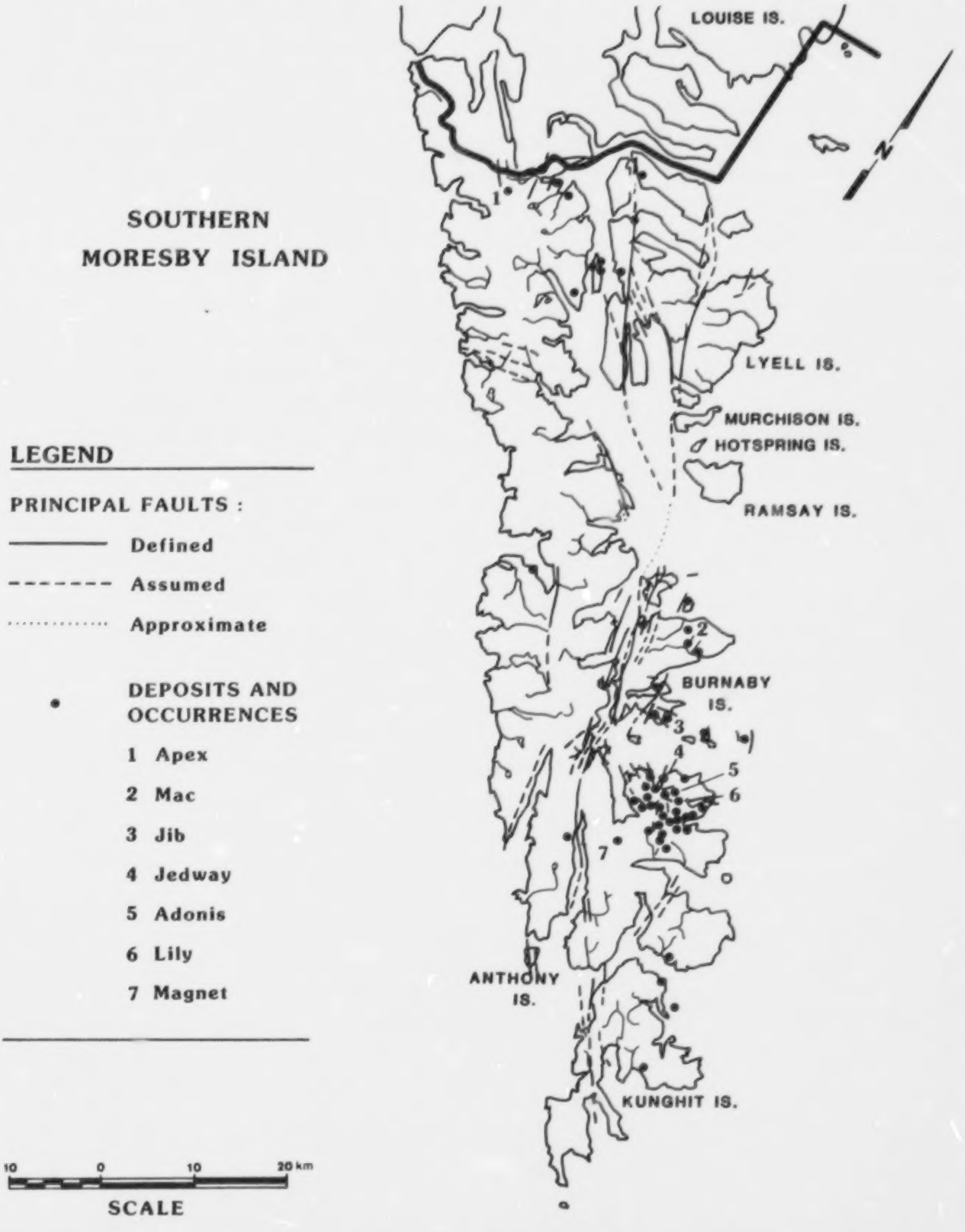

SOUTHERN
MORESBY ISLAND
LEGEND
PRINCIPAL FAULTS :
Defined
Assumed
Approximate
DEPOSITS AND OCCURRENCES
1 Apex
2 Mac
3 Jib
4 Jedway
5 Adonis
6 Lily
7 Magnet
10
0
10
20 km
SCALE
LOUISE IS.
N
LYELL IS.
MURCHISON IS.
HOTSPRING IS.
RAMSAY IS.
BURNABY IS.
ANTHONY IS.
KUNGHIT IS.
1
2
3
4
5
6
7

TABLE 14: Value of Past Mineral Production and Undeveloped Mineral Reserves (1981 Value)

Deposit Name	Production Amount (tonnes/year)	Measures Reserves (tonnes)	Metal Content[1]	Metal Value (1981 dollars)	
				Production	Reserves[2]
1. Apex		272 160	iron 50 % copper 1 %		4 187 000 5 445
2. Mac		7 257 000	iron 49.5 %		110 596 000
3. Jib		8 200 000	iron 50 %		126 154 000
4. Jedway	3 842 895	962 800	iron 2 067 944+	41 399 000	19 256 000
5. Adonis	106 674	137 000	iron 35 %	1 149 000	1 475 384
6. Lily(Ikeda)	13 410		gold 51 195g silver 862 548g copper 574 055kg copper 574 055kg	767 925 215 637 1 148 110 1 148 110	
7. Magnet		453 600	iron 60 %		8 374 154
44. Other Deposits (value determined) Other Deposits (value not determined)	187	758 176	copper, silver	33 755	8 942 681
TOTAL 62	3 963 166	16 828 960		$44 679 672	$278 990 664

[1] Metal values used are: iron $20/tonne @ 65 % iron

gold	$15/gram
silver	$.25/gram
copper	$2/kilogram

[2] Not economic at today's metal prices, (see Figure 16 for definite locations).

TABLE 15: Mineral Value by Commodity

Commodity	Value of Production[1] to Date (from Table 1)	Approximate Value of Measures Reserve and Indicated Res.	Likelihood of Discovering New Resources
Iron	$42,548,000	$280,000,000 +	very high
Gold	785,655	unknown, based on current activity, likely to be very significant, greater than one billion	very high
Silver	217,660	unknown	moderate
Copper	1,176,378	unknown - moderate?	high
Zinc	nil	unknown - low? insufficient info.	unknown
Molybdenum	nil	unknown - low? insufficient info.	unknown
Total	$44,727,693		

[1] Values in 1982 dollars.

[2] Based on current knowledge, does not discount discoveries of mineralization in environments previously unrecognized.

Mineral exploration activity and claim staking has conflicted with other proposed land uses in the planning area. In the absence of detailed government-funded mineral evaluation surveys, information generated by the private sector is the only means of obtaining a detailed understanding of the geology and mineral deposits.

There are a large number of mineral claims in South Moresby. Their distribution as of January 1, 1983 is shown on Figure 17. Claims have been staked since 1978. Total land area covered is 35 491 hectares, about 24.4 percent of the total land base of the planning area. The amount and distribution of claims will change over time as new mineral discoveries are made and staked, and old claims are found to contain insignificant mineralization and are allowed to lapse. It is emphasized that mineral claims may not be a true measure of mineral potential of an area but are a measure of present exploration activity and interest.

Mineral Potential

Mineral potential is perhaps the most important concept to understand when discussing the future of the mineral industry for a particular region. The term "mineral potential" is defined as the probability of finding an orebody of a certain size. Mineral potential maps outline areas of varied potential showing the location and extent of regions in which mining activities exist or can be expected, based on current knowledge. The general mineral potential for the planning area is shown on Figure 18.

Mineral potential estimates of an area will change as the geological data base increases, primarily through surveys conducted by exploration companies. The discovery of a new deposit in an area previously determined to have low mineral potential for example will require that it be redesignated as moderate or high potential. Mineral potential may similarly be downgraded as a result of exploration which proves that economic value is lower than originally anticipated. In addition, improved mining and mineral processing technology and economic factors may result in a previously uneconomic resource becoming economic.

Figure 17 MINERAL CLAIMS AND MINERAL RESERVE LANDS

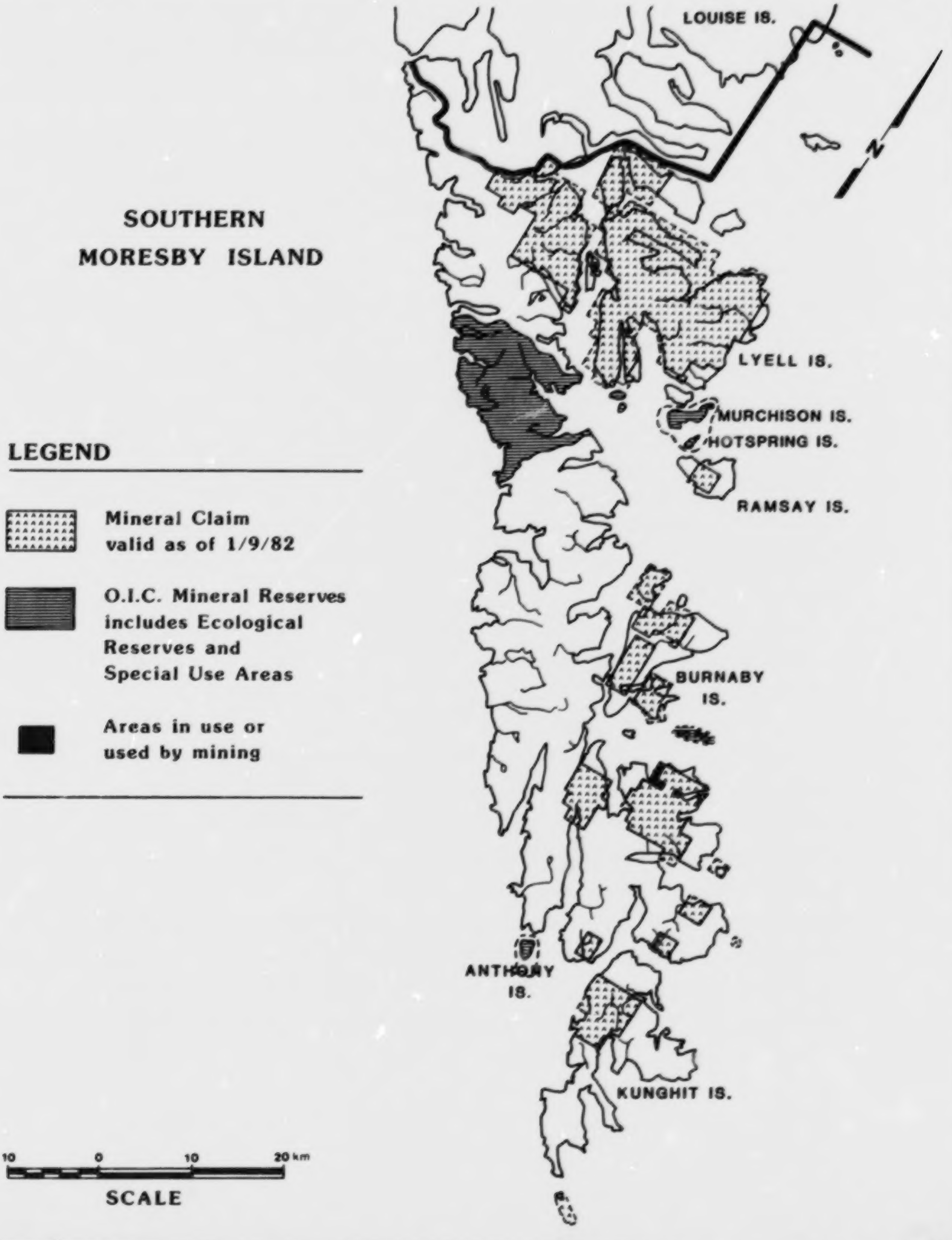
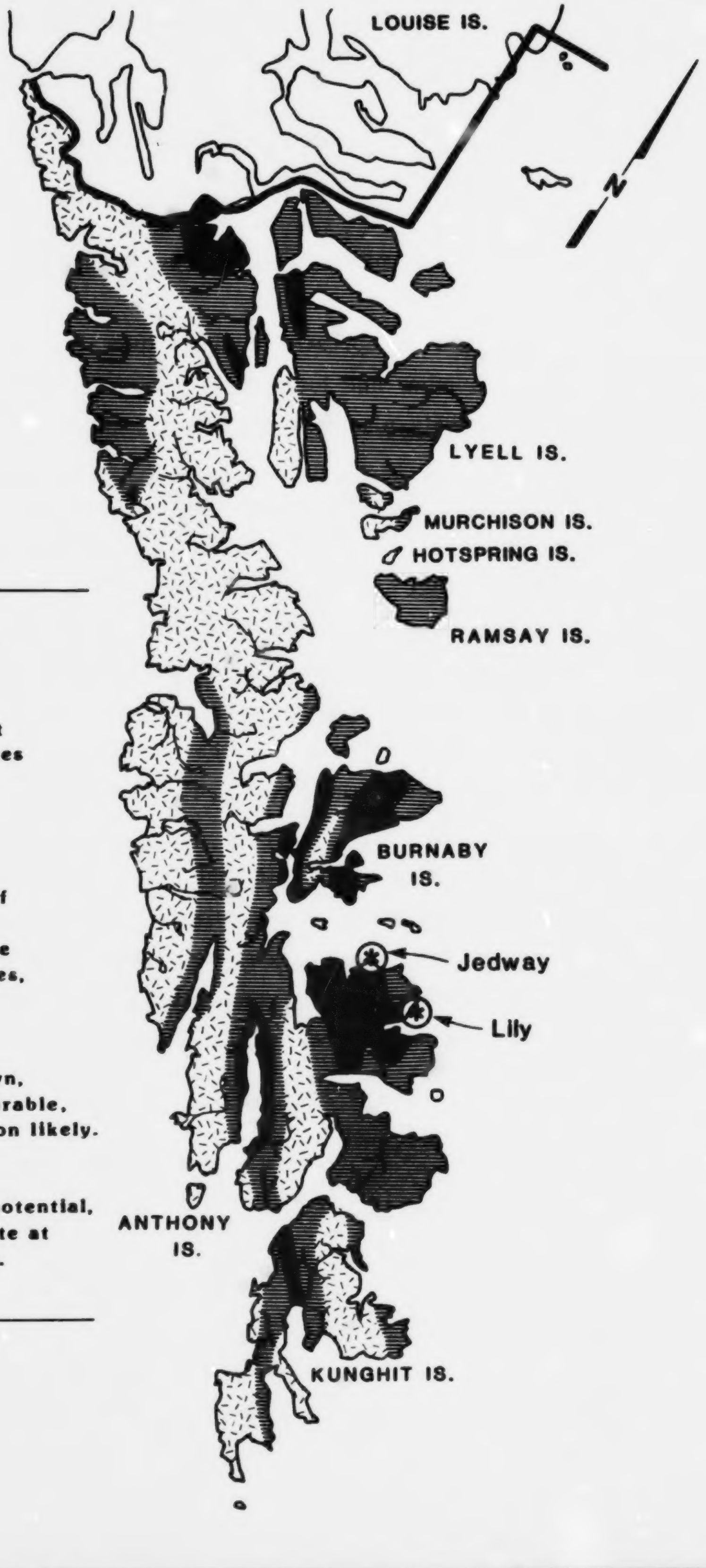

SOUTHERN
MORESBY ISLAND
LEGEND
Mineral Claim valid as of 1/9/82
O.I.C. Mineral Reserves includes Ecological Reserves and Special Use Areas
Areas in use or used by mining
10
0
10
20 km
SCALE
LOUISE IS.
N
LYELL IS.
MURCHISON IS.
HOTSPRING IS.
RAMSAY IS.
BURNABY IS.
ANTHONY IS.
KUNGHIT IS.

Figure 18 METALLIC MINERAL POTENTIAL

SOUTHERN MORESBY ISLAND


LOUISE IS.
N
LYELL IS.
MURCHISON IS.
HOTSPRING IS.
RAMSAY IS.
BURNABY IS.
Jedway
Lily
ANTHONY IS.
KUNGHIT IS.

LEGEND

METALLIC MINERAL POTENTIAL

⊛	**AREA CLASS 1 - Very High** Deposits of known value, past producing mines, and properties at an advanced stage of evaluation or development
■	**AREA CLASS 2 - High** Some deposits known, type of occurrence and geological environment favourable, some exploration at advanced stages, continued exploration.
▤	**AREA CLASS 3 - Moderate** No significant deposits known, geological environment favourable, present and future exploration likely.
▨	**AREA CLASS 4 - Low** Some indication of mineral potential, geological status indeterminate at present, exploration possible.

10 0 10 20 km
SCALE

Mineral potential classification is determined by the following criteria:

i. Geological environment and kinds of mineral deposits known to exist in that environment

ii. Production history of properties in the area and/or in similar geologic environments elsewhere.

iii. Known mineral occurrences, regardless of present economic viability.

iv. Past and present mining exploration activity; this is shown by the number and location of present and former mineral claims, Crown grants, placer leases, etc.

Map designations of mineral potential use two parameters: probability and size. Probability is simply the likelihood of finding an orebody and rests on the assumption that areas of favourable geology containing the greatest density of mineral deposits, or extensions of such areas having similar geology, have the highest probability (high mineral potential) of containing economically viable deposits. Mineral exploration is likely to be more intense in high potential areas as often reflected by the distribution of mineral claims. The four mineral potential classes used on Figure 18 are defined as follows:

Class 1 - very high potential
Based on producing deposits of known value, past producing mines, and properties at an advanced stage of evaluation or development. Boundaries based on geological factors which control ore distribution. Jedway deposit area is Class 1 potential.

Class 2 - high potential

Some deposits known; type of occurrence and geological environment favourable for discovery of economic deposits; some exploration at advanced stages. Boundaries based on geological environments that host mineralization.

Class 3 - moderate potential

No significant deposits known, may contain favourable geology with localized high potential and minor occurrences. Present and future exploration likely.

Class 4 - low or indeterminate potential

Geologically less promising terrain with indeterminate potential based on a paucity of information, subsequent exploration may indicate high potential.

Metallic Mineral Deposit Types

The planning area contains 62 metallic mineral deposits and occurrences (Revised Mineral Inventory Map 103B and C, MEMPR). These can be grouped into two major types of metallic mineral deposits; several are less well understood and have not been classified.

Jedway, Apex, Mac, Jib and Tasu are examples of metasomatic deposits that contain iron, copper, gold and silver. Similar deposits occur in South Moresby that contain appreciable reserves and may be exploited in the future. Areas of Class 1 and 2 potential for this type of deposit are recognized by the intrusion of granitic rocks into Kunga Formation limestone and Karmutsen Formation volcanics.

Gold deposits are the second major type. They occur in a wide variety of rock units but have several specific mineralizing features. Requisite features for Class 2 and 3 potential for these types of deposits include quartz veining, complex fault systems, metal occurrences in quartz-rich rocks, cross-cutting young intrusive rocks (dykes) and spatial relationships to former volcanic centers.

Other types of mineral deposits that may exist in the South Moresby are massive sulphide deposits of copper, zinc, and lead in submarine volcanic rocks of Yakoun Formation, porphyry deposits of copper and molybdenum in young quartz-rich intrusive rocks, vanadium mineralization in volcanic flow tops, and placer gold deposits.

The known deposits and occurrences in South Moresby are at varying stages of exploration. They can be divided into three categories: (A) developed, (B) partially developed and (C) undeveloped.

(A) 25 deposits are at a mature stage of exploration. Defined reserves based on drilling results. Future production is possible.

(B) 11 prospects and occurrences are only partially developed. These represent the focus of current exploration effort (primarily for gold). Further exploration is necessary to determine economic viability.

(C) 26 occurrences are undeveloped and there is very little geological data available on them. No active exploration at present. Data insufficient for reserve estimation.

Industrial Minerals and Energy Resources

The industrial mineral potential of the planning area is presently considered to be low. Deposits of quality sand and gravel are unsurveyed but not anticipated to be extensive. 364,000 tonnes of crushed rock produced as a by-product of Jedway Mine is stockpiled at Funter Point and currently under consideration for removal to the Ridley Island coal and grain terminal. Limestone deposits represent an unexploited but low-value commodity.

Exploration interest for petroleum and natural gas in sedimentary rocks that underlie Hecate Strait has increased in recent years as evidenced by the large number of permits applied for and granted. Work is being held in abeyance pending resolution of provincial-federal jurisdiction. The occurrence of commercial reserves depends on the coincidence of a large number of factors such as source rocks, favourable traps, porosity and permeability.

Hotsprings on Hotspring Island off the east coast of the planning area result from deeply circulating heated water rising to the surface along fault systems. The geothermal resource potential of the area has not been investigated.

Economic Analysis of the Mineral Industry

The economic profile of the mineral industry is divided into two periods; past (pre-1979 to 1981), and present and future (relating to exploration activity commenced about 1979).

Past

Table 14 summarizes approximate 1981 values of documented past metal production, and provides a summary estimate of value for measured/indicated reserves by commodity. Primary sources of information are MEMPR mineral deposit files, and Bulletin No. 54. It is evident from these sources that the total value of proven and possible mineral resources is substantial. Total value of production to date represents a small part of the ultimate mineral resource potential.

Assessment Reports for exploration work conducted in B.C. document work performed on a mineral claim, and list results and a statement of expenditures. Reports for the planning area date from 1957; expenditures documented from 1957 to 1978 totalled $1,693,500. The majority of this was spent on the detailed exploraton of Jedway and Jib. It is very likely that considerable regional exploration occurred for which no data is available. Table 16 summarizes exploration expenditures for all years, as documented in assessment reports.

Jedway mine operated from 1962 to 1968 and had a major economic influence in the study area and in the Queen Charlotte Islands as a whole. The mine was a major employer with up to 150 full-time employees, in addition to being an important purchaser of goods and services and tax base. The regional and provincial significance is shown in Table 17. The total land area used for this activity was around 300 hectares, 0.2 percent of South Moresby. The Jedway Mine closed before the reclamation requirements under the Mines Regulation Act were enacted and the mine site was not reclaimed.

Present and Future

From 1979 to 1981, assessment reports indicate that over $1.4 million were spent on exploration in the planning area, primarily in search of gold deposits. Direct local expenditures accounted for about 25 percent of this amount and included such items as food, transportation services, accommodation, and building supplies.

TABLE 16: Summary of Documented Exploration Expenditures* on Mineral Claims in South Moresby Since 1957

Year	Assessment Assessment Report Number	Expenditures ($ 1981) Total Cost of Exploration Program	Amount Spent Locally
1957	193, 194, 195	2,685	n.d.**
1959	Company Report (Jedway)	473,536	n.d.
1960	Company Report (Jedway)	391,380	n.d.
1961	Company Report (Jedway)	74,155	n.d.
1963	481, 482, Company Report (Jib)	306,091	n.d.
1965	481, 482, Company Report (Jib)	386,342	n.d.
1968	1245	6,000	468
1970	2879	15,279	2,772
1972	3602	3,685	1,229
1973	4668	34,400	3,332
1979	7820, 8071, 8093, 8094, 8197	61,995	16,194
1980	8224, 8251, 8353, 8383, 8412, 8438, 8501, 8561, 8663, 8714, 8901, 8903, 9012, 9014	331,372	85,670
1981	15 est.	987,000	276,360
1982	est. 8 - 12 est.	300,000	-

* 1981 dollars.

** n.d. - no data available or level of disaggregation not sufficient to permit estimation.

TABLE 17: **Regional and Provincial Significance of Jedway Mine**

Year	Iron Concentrate Production (tonnes) Jedway	 Total B.C.	Jedway Production as % oF B.C.
1962	53 515	1 793 847	3
1963	339 008	2 060 241	16.5
1964	383 034	2 002 562	19
1965	395 442	2 165 403	18
1966	515 299	2 151 804	24
1967	417 852	2 154 443	19.5
1968	112 589	2 094 745	5.5

Minimum annual exploration expenditures required by regulations to maintain existing claims are $298,075. Based on recent statistics, this expenditure will generate 630-810 mandays employment. Exploration expenditures also generate additional supportive and dependent economic activity and employment elsewhere in the Queen Charlottes and British Columbia. Mineral industry statistics for 1982 produced by the Mining Association of B.C. indicate a provincial expenditure induced income multiplier effect of 1.11 and a provincial employment multiplier of 1.48. Multiplier figures are always somewhat uncertain and are difficult to derive and interpret. Indirect and induced economic activity due to mining has therefore not been quantified; however, the multiplier effect does exert an influence on the economy.

Exploration for gold deposits in South Moresby is still at an early stage of development. If an economic deposit is found and brought into production the province would benefit in terms of employment creation, supply of goods and services and increased tax revenues.

The application to remove 364 000 tonnes of crushed waste rock from the old Jedway mine stockpiled at Funter Point for use at the Ridley Island coal and grain terminal may become an example of economic mining activity. The Ministry of Energy, Mines and Petroleum Resources has estimated the crushed rock to be worth approximately $3.5 million, based on a value of $10 per tonne.

Table 18 relates mineral exploration expenditures in South Moresby during 1979 to 1981 to expenditures in the Queen Charlotte Islands as a whole, and British Columbia. Exploration in the study area has increased in relation to the Queen Charlottes and the province. South Moresby amounts to 0.15 percent of the provincial land area, yet in 1981 accounted for one percent of exploration expenditures.

TABLE 18: Regional and Provincial Significance of Recent Exploration Expenditures

	Exploration Expenditures	% of B.C.	% of Q.C.I.
1979			
British Columbia	53 810 829	100%	-
Queen Charlotte Islands	746 853	1.39	100%
South Moresby Island	61 995	0.12	07.7
1980			
British Columbia	92 892 714	100%	-
Queen Charlotte Islands	762 158	0.82	100%
South Moresby Island	331 372	0.35	30.3
1981			
British Columbia	113 000 000	100%	
Queen Charlotte Islands	unknown	-	
South Moresby Island	987 000	1%	

4.0 SOUTH MORESBY LAND USE ALTERNATIVES

The South Moresby Resource Planning Team recognized early in the course of its deliberations that it would not be possible to formulate a single land use proposal for recommendation to the ELUC, given the complexity of interests and resource values represented on the planning team. The work of the SMRPT in land use planning has therefore been concentrated on identifying a meaningful series of alternatives for the area. Design of these alternatives has involved (i) describing and defining a system of land use zones which have certain priorities of use and management implications attached to them, and (ii) employing those zones in various combinations over the study area in the design of land use options. The resulting series represents a range of concepts and philosophies of land use which the team feels are most worthy of consideration. The zones and options are described in Sections 4.1 and 4.2.

4.1 Land Use Zones

Two land use zones have been developed. These zones, which have been termed Natural Zone and Resource Development Zone, concern only the terrestrial component of South Moresby. The marine environment is discussed in this section, but zonation has not been applied to the marine component of the area.

The theme for each of the two zones is developed by (i) a statement of objective indicating the priority of land use, (ii) a strategy to be followed in management, and (iii) a reference to the formal land status which could be applied.

4.1.1 NATURAL ZONE

Management Objectives

The Natural Zone includes areas where wilderness, recreational, scientific, scenic, cultural and spiritual values are paramount. Accordingly, lands designated Natural Zone within South Moresby shall be protected and managed so as to:

a) maintain the area in a natural undisturbed state.
b) maintain traditional Haida uses of the land,
c) provide opportunities for wilderness recreation, and
d) permit scientific research and educational activities.

Management Strategy

A. The use and enjoyment of Natural Zone areas for wilderness recreation is encouraged. Guided boating tours accommodating small groups of people are preferred, as are private recreational boat trips. The management and regulation of this use must adhere to the spirit of the Natural Zone by ensuring the retention of all existing natural features and values in an undisturbed state. Recreational access to areas such as abandoned Haida village sites, caves, and seabird colonies will have to be limited to prevent damage to these sites. Similarly, general recreational use will require management to ensure that wilderness recreation values are not degraded. Some primitive facilities development could also be considered for areas of exceptionally heavy use. These precise mechanisms will be developed during the plan implementation phase, after the managing agency has been designated.

B. Guided and individual recreational hunting and sport fishing is permitted in Natural Zone areas. However, conservative regulations must be developed and enforced by the managing agency to a) maintain species abundance and b) minimize conflict between hunters and other recreational use. Trapping activity would be confined to existing trappers. If existing trapping rights lapse, no new authority would be issued.

C. Scientific research and educational activities are encouraged in the Natural Zone. Investigations into the physical environment, fisheries, wildlife biology, geology or archaeology would be encouraged, provided such investigations involve a low impact to the natural environment.

D. Traditional Haida use of lands in the Natural Zone would continue.

E. The Natural Zone designation requires the exclusion of timber harvesting. Portions of T.F.L. #24 within the Natural Zone would be withdrawn immediately from the T.F.L. with appropriate compensation to the licencee, if warranted. No new forest tenures would be issued for Natural Zone areas in the South Moresby supply block of the Queen Charlotte Timber Supply Area, and the wood volumes in the Natural Zone would be removed from the forest inventory for A.A.C. determination purposes.

F. Mineral exploration and development would be excluded from those areas not currently under mineral claim through the establishment of reserves from mineral staking. Existing mineral claims would be recognized but would be subject to special exploration and reclamation guidelines. As claims lapse mineral reserves would be designated as completely and as quickly as possible.

Note: An alternate mineral resource strategy for Natural Zones is described in Section 4.3. If the alternate approach were to be adopted, this recommendation would require substantial modification.

G. All private residential and commercial developments within the Natural Zone would be prohibited. Industrial uses of foreshore land, such as for log booming, are also excluded. Existing parcels of private land within the Natural Zone would be obtained by the Crown as quickly as possible. Some minor tenures could be issued for very low-impact uses such as telecommunications sites.

H. Resource management practices that contribute to the protection and maintenance of resources in a "natural" state will be permitted in Natural Zones (low-level salmon enhancement, forest protection).

Land Status

A Natural Zone could be managed through a number of provincial designations for Crown land. Designations under the PARK ACT should be considered, wherever logical park boundaries can be located. It is also possible for portions of a Natural Zone to remain in the provincial forest and be managed by the B.C. Forest Service for recreational use only. Ecological reserves are a third provincial designation which may be applied to specific units suitable as representative examples of natural ecosystems or containing unique ecological phenomena. Natural Zone objectives may also be met under national park status in the event of a provincially endorsed national park proposal from the federal government. In addition, both federal and provincial governments may seek to establish all or a portion of the Natural Zone as a World Heritage Site or Man and the Biosphere site through UNESCO, providing appropriate legislative protection is already in place. The land status of a Natural Zone should in all cases maintain the area as natural undisturbed land.

4.1.2 RESOURCE DEVELOPMENT ZONE

Management Objectives

The Resource Development Zone would provide for ongoing opportunities for resource development, consistent with the philosophy of integrated resource management as conveyed in the MINISTRY OF FORESTS ACT. Overall environmental protection needs are also recognized. Management will encourage:

a) production and harvesting of timber;

b) mineral exploration and development;

c) the utilization, protection, and possible enhancement of fish, wildlife, water and outdoor recreation values within an overall integrated use framework;

d) the protection of archaeological and other heritage resources.

Management Strategy

A. The Resource Development Zone would be subject to existing provincial and federal resource legislation. Timber harvesting and forest management would be conducted under Management Working Plans and harvesting plans approved by the Ministry of Forests. Standard approaches to integrated resource planning would apply in Resource Development Zone. At the broad planning level, other resource interests are recognized through Ministry of Forests Environmental Sensitivity Area (E.S.A.) mapping, and through the T.F.L. Licensee's Environmental and Technological Operability (E.T.O.P.) mapping. At more detailed levels, standard harvest planning procedures incorporate consideration for other resource values.

B. Mineral exploration and claim staking would continue. Specific guidelines would be developed for exploration in sensitive areas adjacent to core recreational areas or heritage sites. Mine development would be subject to guidelines under the provincial metal mines review process.

C. Areas of particular recreational interest should be the focus of detailed recreation inventory and planning. Recreation sites would be identified and developed when required in accordance with established policies for Forest Service recreation sites. Deferment or reservation from timber harvesting could be considered in areas of exceptional recreational value.

D. Forest landscape planning may be required in areas of high aesthetic value, particularly in those areas adjacent to high use recreational sites.

E. Statutory approaches would apply to the management of fish and wildlife resources, including sports fishing, hunting, trapping, and the licensing of guide outfitters. During industrial operations, fish and wildlife resources are protected largely through the use of the standard inter-agency referral process.

F. Heritage sites would be conserved and protected in accordance with established provincial policies.

G. Scientific and educational pursuits would be considered compatible uses.

H. Foreshore use would continue under current policy and procedures.

Land Status

Lands within Resource Development Zones would retain their current FOREST ACT status as Tree Farm Licence, or Timber Supply Area. Provincial Forest status would also continue to be in effect, while LAND ACT tenures would be issued as required in both foreshore and upland. Specific areas of exceptional recreational value could be designated as recreational sites under the FOREST ACT. Small areas of special ecological interest could be designated as ecological reserves under the ECOLOGICAL RESERVES ACT.

4.1.3 MARINE ENVIRONMENT

The management of the marine environment adjacent to the upland areas of South Moresby has not been addressed in detail in this report. Federal jurisdiction and policies over marine resources has made it difficult to define possible management strategies in a planning exercise established under the authority of the provincial government. Specifically, the Department of Fisheries and Oceans at the planning team level has not been able to devise management strategies for marine resources that cover as broad a spectrum as those considered for upland resource management. This is due to Department of Fisheries and Oceans policy which precludes alterations to current or realized sustainable levels of harvest in South Moresby. A Department of Fisheries and Oceans proposal to avoid conflict with possible upland designations by dispersing areas of activity or schedule of harvest was considered as a policy for marine resource management. However, the planning team recommends that options for management of marine resource must include a broader range of possibilities with strategies similar and compatible to those proposed for adjacent upland. This may include major restrictions to harvesting in areas adjacent to upland Natural Zone. Issues such as commercial vs. recreational harvest or finfish and shellfish restrictions would require specific review.

As a result of this situation a management strategy for marine resources cannot be resolved at this time. Recommendations for further action are contained in Section 7.0.

4.2 Land Use Options

In an area as large and complex as South Moresby, a great number of alternatives for land use can be developed. For planning purposes, however, it is often necessary to limit the number of alternatives that are described and evaluated. For that reason, the planning team has focused its discussions on South Moresby on four options for land use in the area.

Three important principles formed the basis for the development of the options described in this report:

i. In all options, at least some Natural Zone is recommended for three core areas of high recreational interest: the Burnaby Narrows area, the Hotsprings Island/De la Beche Inlet area, and the Anthony Island area.

ii. Where a particular option provides for additional Natural Zone beyond that described in Point (i), this Natural Zone designation is concentrated as much as possible in contiguous blocks. This principle is based on the view that wilderness recreation opportunities are most effectively provided through relatively large areas of Natural Zone that are separated as much as possible from Resource Development Zone.

iii. Consideration was given in option development to providing a range of impacts on the combined allowable annual cut for the Tree Farm Licence and the Timber Supply Area.

The principle of contiguous Natural Zone referred to in Point (ii) is one of two general approaches investigated by the team during the development of options. The other approach, referred to as the mosaic strategy, involved an intermingling of Natural Zone and Resource Development Zone throughout the area. The mosaic strategy was ultimately viewed by the team as being generally less desirable than the contiguous approach.

The four options present a wide range of possible resource management approaches in South Moresby. The options are illustrated in map form in Figures 19 through 22. Please note that the order in which options are presented does not reflect any preference on the part of the planning team. The options can be described briefly as follows:

Option 1: Resource Development Emphasis

This option emphasizes resource development, with Natural Zone designated within the three core recreation areas mentioned previously.

Option 2: Burnaby Split

This option provides for mainly resource development in the northeast portion of the area, with this designation extending as far south as northern Burnaby Island. Contiguous Natural Zone is introduced from Burnaby Island south, and on the west coast of Moresby Island.

Option 3: Juan Perez Split

This option designates a contiguous Natural Zone which includes the islands in Juan Perez Sound and all lands to the south. Lyell Island, the adjacent islands to the north, and the nearby portion of Moresby Island are Resource Development Zone.

Figure 19 OPTION 1 - Resource Development Emphasis

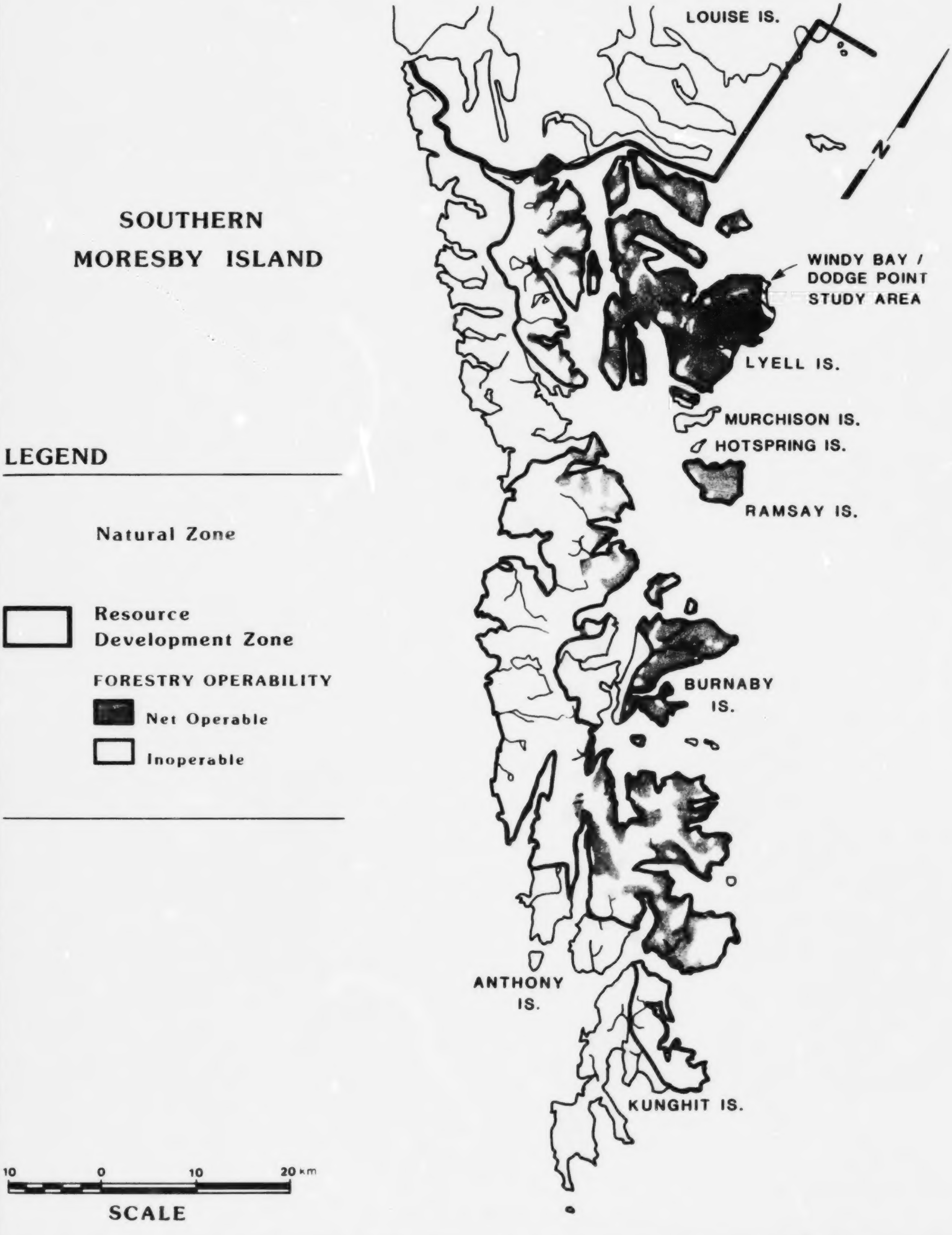

SOUTHERN
MORESBY ISLAND
LEGEND
Natural Zone
Resource Development Zone
FORESTRY OPERABILITY
Net Operable
Inoperable
10 0 10 20 km
SCALE
LOUISE IS.
N
WINDY BAY / DODGE POINT STUDY AREA
LYELL IS.
MURCHISON IS.
HOTSPRING IS.
RAMSAY IS.
BURNABY IS.
ANTHONY IS.
KUNGHIT IS.

Figure 20 OPTION 2 - Burnaby Island Split

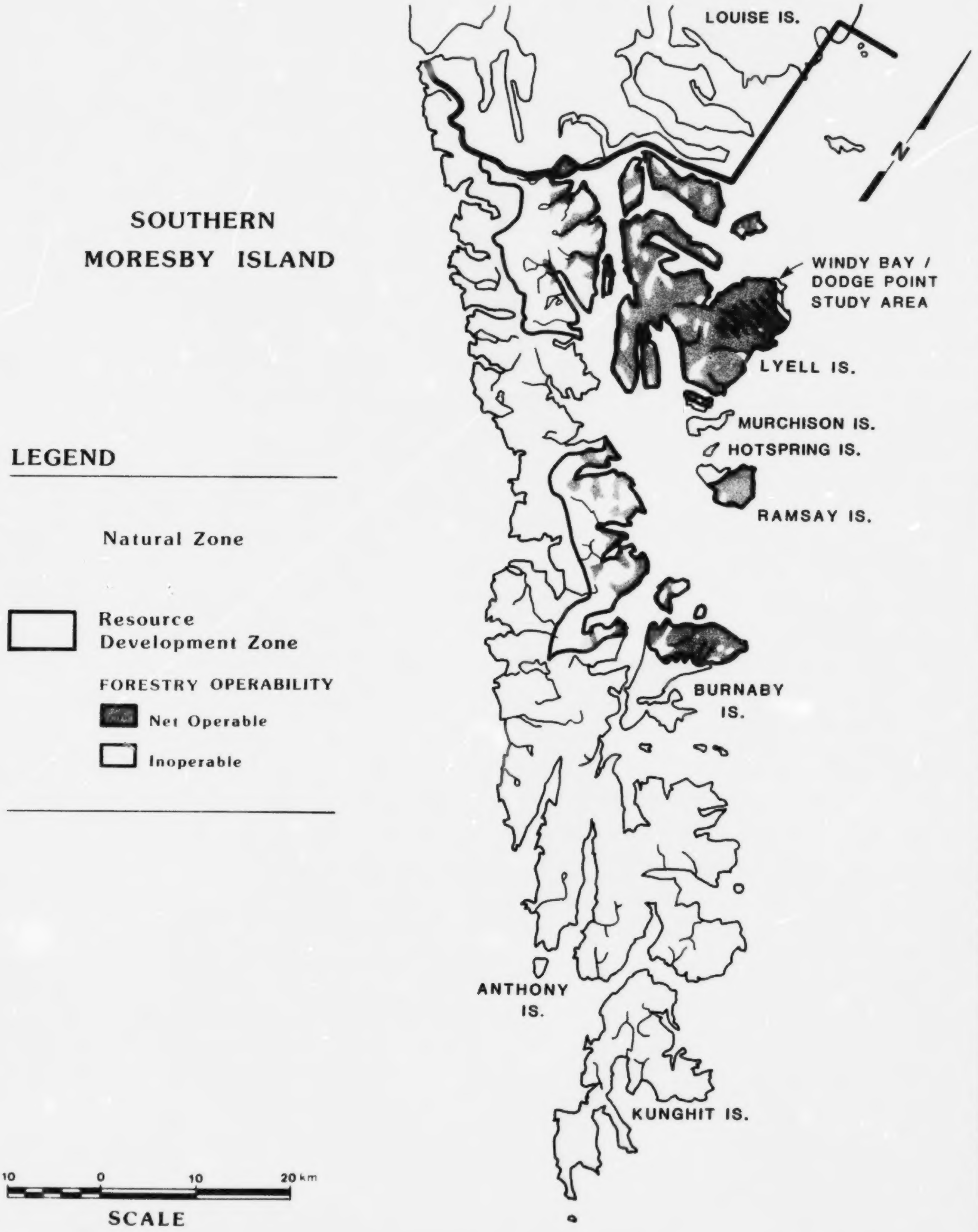
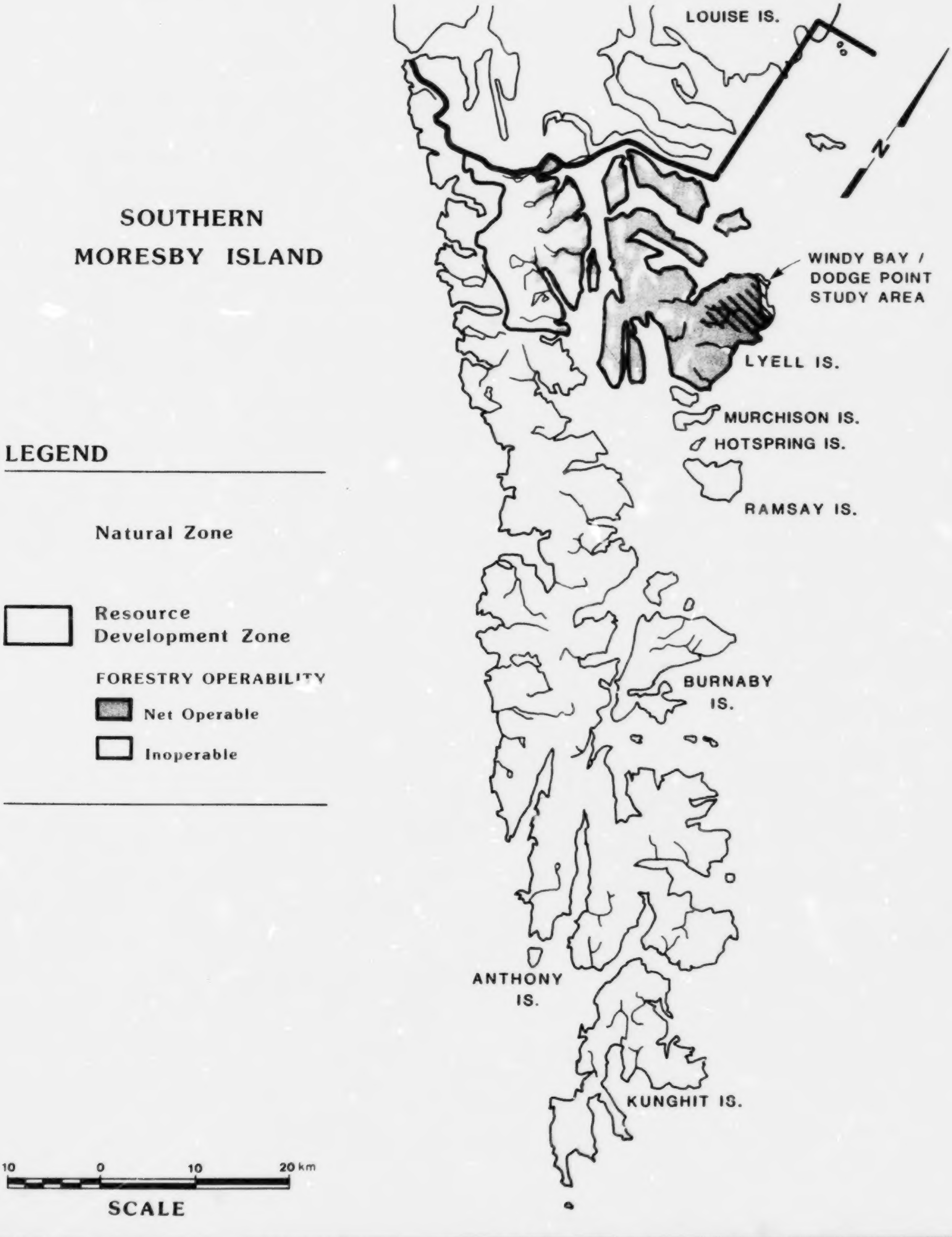

SOUTHERN
MORESBY ISLAND
LOUISE IS.
WINDY BAY / DODGE POINT STUDY AREA
LYELL IS.
MURCHISON IS.
HOTSPRING IS.
RAMSAY IS.
BURNABY IS.
ANTHONY IS.
KUNGHIT IS.
N
LEGEND
Natural Zone
Resource Development Zone
FORESTRY OPERABILITY
Net Operable
Inoperable
10
0
10
20 km
SCALE

Figure 21 OPTION 3 - Juan Perez Split


SOUTHERN
MORESBY ISLAND
LEGEND
Natural Zone
Resource Development Zone
FORESTRY OPERABILITY
Net Operable
Inoperable
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20 km
SCALE
N
LOUISE IS.
WINDY BAY / DODGE POINT STUDY AREA
LYELL IS.
MURCHISON IS.
HOTSPRING IS.
RAMSAY IS.
BURNABY IS.
ANTHONY IS.
KUNGHIT IS.

Option 4: Natural Emphasis

In this option, a Natural Zone has been designated over almost all South Moresby, with Resource Development Zone confined to the currently active logging areas on Lyell Island.

The distribution of Natural and Resource Development Zones by area and length of shoreline in South Moresby are summarized in the following tables.

TABLE 19: Area Summary of South Moresby Land Use Options

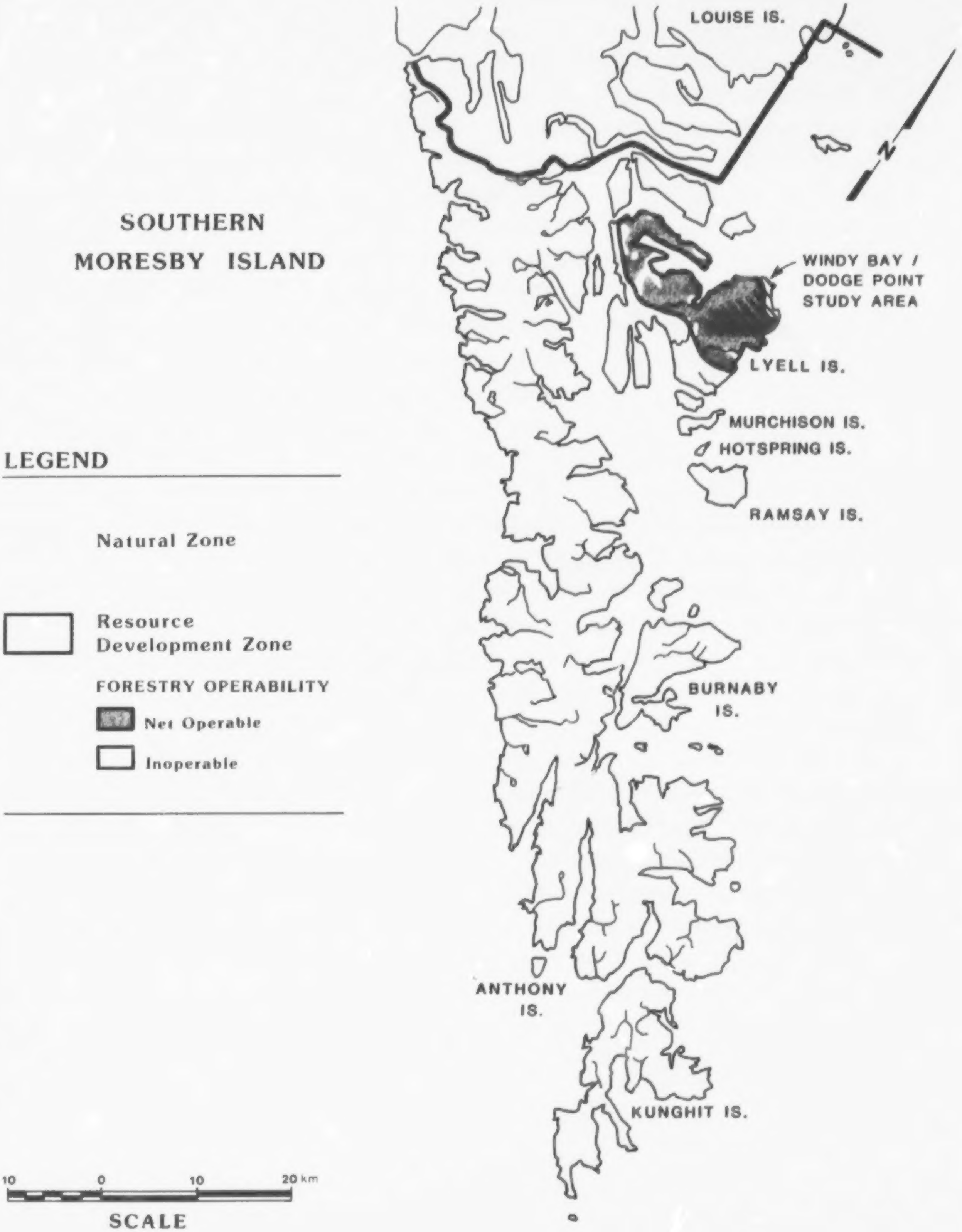
	Natural Zone		Resource Development Zone	
	Area (ha)	%	Area (ha)	%
Option 1	48 500	33.4%	96 800	66.6%
Option 2	100 500	69.2%	44 800	30.8%
Option 3	113 800	78.3%	31 500	21.7%
Option 4	137 400	94.6%	7 800	5.4%

TABLE 20: Length of Shoreline Summary for South Moresby Land Use Options

	Natural Zone		Resource Development Zone	
	Length (km)	%	Length (km)	%
Option 1	790	54%	675	46%
Option 2	1 129	72%	336	23%
Option 3	1 253	86%	212	14%
Option 4	1 409	96%	56	4%

The reader is reminded that the land use options outlined in this report do not directly address proposals for the Windy Bay/Dodge Point area. It is assumed that any of the four options described here could be combined with either of the two ecological reserve proposals outlined in the Windy Bay/Dodge Point Report of December 1981.

Figure 22 OPTION 4 - Natural Emphasis


SOUTHERN
MORESBY ISLAND
LEGEND
Natural Zone
☐ Resource Development Zone
FORESTRY OPERABILITY
▨ Net Operable
☐ Inoperable
10 0 10 20 km
SCALE
LOUISE IS.
N
WINDY BAY / DODGE POINT STUDY AREA
LYELL IS.
MURCHISON IS.
HOTSPRING IS.
RAMSAY IS.
BURNABY IS.
ANTHONY IS.
KUNGHIT IS.

4.3 Alternative Approach to Mineral Resources

The prohibition of mineral resource exploration and extraction outside of existing mineral claims in the Natural Zone as proposed in Section 4.1.1. has been the subject of extended debate. This proposal and the range of land use options and zones developed in Section 4.1 is opposed by the Ministry of Energy, Mines and Petroleum Resources (MEMPR), since it would result in the alienation of unevaluated mineral lands. The MEMPR feels they should be evaluated before being alienated from exploration. The Ministry has therefore proposed an alternative approach that would permit controlled mineral exploration and development over all but the most environmentally sensitive areas of the Natural Zone. This alternative was developed because the land use designations and zones described in Section 4.1.1 could not adequately address potential mineral values to the same extent that the more readily measured surface resources can be evaluated.

This approach is a minority position, supported almost exclusively by the MEMPR. The reasons for this are two-fold. First, MEMPR holds that the management constraints they propose are not within the team's mandate to alter. Secondly, the alternate approach is contrary to the values and management strategies which evolved in Section 4.1, and this was held by some team members to be unacceptable.

The alternate approach provides for continuing mineral claim staking and development opportunities in the Natural Zone. This would permit an improved mineral inventory, identification of economic deposits and retain future options for development. Lands could then be allocated with full consideration of the impacts on subsurface resources. Mineral exploration by industry would continue to be the method used to achieve inventory objectives. However, this concept proposes that mineral exploration should only be permitted under closely monitored conditions to minimize loss of recreation, biological, archaeological or other natural values. Specific features of this alternative approach are:

i. Core recreation areas in the Burnaby Strait and Houston Stewart Channel areas would be immediately placed under a reserve from claim staking for a minimum duration of five years. During this time the Ministry of Energy, Mines and Petroleum Resources would be required to undertake a mineral potential assessment. Special funding would be required to undertake detailed field examination of the geology, geochemical sampling and perhaps geophysical surveys. Results of the field examinations would permit the Ministry to establish the mineral potential of core recreation areas and permit a land allocation decision with improved knowledge and without potential mineral claim encumbrances.

ii. Lands within the Natural Zone which have specific sensitivities to physical disturbance, for example, archaeological sites and highly productive salmon spawning streams, will be identified on a series of resource maps. These will be used to regulate the type, timing and intensity of exploration activity permitted.

iii. All proposed mineral exploration activities documented in the Notice of Work and Reclamation Program on a Mineral Property would require review by other resource agencies. Work which may cause significant surface disturbance, for example trenching or road construction, would require review by an inter-agency committee prior to allowing work to proceed. No one agency should have veto power.

iv. Mine development proposals would be dealt with under the current "Procedures for Obtaining Approval of Metal Mine Development". This is a three-stage process under the guidance of a cabinet committee. In the South Moresby this process should make provisions for public involvement at all levels.

v. The Ministry of Energy, Mines and Petroleum Resources will progressively establish permanent mineral reserves for specific areas proposed in the Natural Zone where an appraisal of mineral potential has shown it to be low. This approach would require a less restrictive land status designation for Natural Zone than that described in Section 4.1. A Natural Zone allowing mineral development could be accommodated under the following land designations:

Provincial Forest	- FOREST ACT designation - recreation priority, no timber harvesting
Recreation Area	- PARK ACT designation - Order-in-Council provides for mineral exploration and development.

Since this approach potentially allows mineral exploration and development on any lands designated Natural Zone, and since it gives mineral resources special consideration over all other resources, it has not been acceptable to the majority of planning team members.

5.0 EVALUATION OF LAND USE OPTIONS

This section evaluates the four land use options as they affect the South Moresby resource uses and values described in Section 3.0. The options are evaluated according to the resulting changes to existing opportunities, activities or industry related to each resource. Section 3.0 has therefore established a baseline and the various criteria for evaluation. Section 5.0 is in this respect an assessment of impacts on the status quo.

5.1 Natural Environment Evaluation

This section evaluates the impact of each option on the natural values of South Moresby. Geology, physiography and climate of the area are not discussed further since they are assumed to be unaffected by the various options. Vegetation is not discussed although dramatic changes in vegetation would result from the industrial activities in the Resource Development Zone. The distribution of trees, shrubs, mosses and herbs in the Development Zone would be altered by the various industrial activities foreseen in that zone. The magnitude of these vegetation changes will be directly related to the amount of area in the Resource Development Zone. Thus Option 1 will have much greater impact on existing vegetation and natural forest ecosystems than Option 4.

The potential for impacts on endemic fauna and flora will also be proportional to the area in the Resource Development Zone in each option. The opportunity for study of these endemics and their evolutionary processes diminishes as the amount of relatively undisturbed land decreases. Thus Option 1 would have greater impacts on these scientific values than Option 4.

The impacts of each option on the wildlife and aquatic values are difficult to predict with certainty. However it is expected that a reduction in these natural values will accompany resource development activities.

The degree to which the natural wildlife and aquatic values are diminished in each option depends on two factors: first, the extent to which the habitat of birds, mammals, fish and marine invertebrates is affected; and second, the degree to which the capability for people to use and enjoy these resources is affected.

In the Natural Zone, the habitats of the various terrestrial and marine creatures will fluctuate with natural cycles and events. However, they would be protected from the environmental changes that would likely occur in the Development Zone as a result of various industrial activities.

Mining, logging, settlement, foreshore development and other activities occurring in the Development Zone would be regulated to minimize impacts but major environmental changes would likely occur. In the fresh water streams of South Moresby, flow regimes, temperatures, gravel quality, nutrient cycles and food chains would all be affected by development. Impacts on the fishery resources could be expected. Logging will increase the frequency of landslides in some watersheds and will have impact on fish habitat.

The marine ecosystems described in Section 3.1.5 would be affected by Development Zone activies including log dumping and storage, camp development, fuel storage and various foreshore activities. The type and magnitude of impacts associated with log loss, fuel spillage and degraded foreshores are difficult to define precisely but impacts would occur. Changes would be different from, and greater than, changes expected as a result of natural cycles in the Natural Zone. The present water quality and the rich and highly diverse ecosystems are attributed in part to the lack of industrial activity at present and the quality of this environment would be reduced in the Resource Development Zone.

Seals, sea lions, whales and other marine mammals are potentially affected by marine activities and increased traffic in the Resource Development Zone. Noise disturbance and various environmental changes pose greater risks to these animals than would occur in the Natural Zone.

Impacts on wildlife and bird habitats would occur on the upland portions of the Resource Development Zone as a result of alteration of vegetation and increased disturbance. The many burrow nesting seabirds could be particularly susceptible to on-shore developments because of their dependence on old-growth forests on steep slopes facing the ocean. Present colonies could be delineated and protected from industrial activities. They would require a large buffer area to shield them from disturbance and blowdown. However, forests change over time and seabird colonies move in response to forest succession. Areas of forest not presently occupied by seabirds will be required to provide nesting habitat in the future. The Natural Zone would protect existing colonies and provide for their future requirements. Development Zone activities would pose some risk to existing colonies and remove forest areas that will be required in future.

Predatory birds such as the Peales peregine falcon would be directly affected by any reductions in the seabird population since the seabirds form the major food species at critical times of the year. Falcons could also be affected by the increased disturbance associated with industrial activities.

Other birds such as woodpeckers, eagles, cavity-nesting birds and probably the marbled murrelet, also rely on old-growth forest for nesting habitat. As areas are logged or cleared for other development, the nesting habitat of these birds is lost and under present management practices will not be replaced.

The marten and Queen Charlotte weasel are primarily old-growth forest dwellers and may require these areas for habitat. Development Zone activities could affect these animals. Other land mammals would probably be unaffected.

There would be some positive impacts of the habitat changes expected in the Development Zone. The species of birds and mammals which utilize openings in the forest would increase. Deer populations would expand, at least temporarily, in logged areas. Enhancement opportunities and research projects would probably be more feasible with improved access in the Development Zone. However, in most regards, Development Zone activities represent potential risks to existing habitats and the fish, birds and animals that occupy them. The Natural Zone would protect those habitats in their present state and preserve opportunities for future expansion.

The extent to which the land use zones would affect the ability of people to use and enjoy the natural resources of the environment are also difficult to quantify. However, the present use of wildlife is primarily related to the wilderness-oriented recreational activities presently occurring in South Moresby. This type of use would be severely reduced in the Resource Development Zone and is discussed in detail in Section 5.3.

It is not expected that the Resource Development Zone would have any significant effects on the consumptive use of wildlife for trapping or hunting. Patterns of use and species utilized might be altered and local increases in hunting could be expected around development centres. Existing tenures for trapping and guiding would be maintained.

The following section attempts to evaluate the effects of each of the four land use options. In general the Natural Zone protects existing values and maintains the potential for future expansion. The Resource Development Zone exposes these values to losses or to considerable risk. It is impossible to quantify these losses at this point. The impact of each option is roughly proportional to the amount of area in the Resource Development Zone. However the impact is exaggerated in the options which provide for resource development south of Lyell Island because of greater wildlife values in that area.

Mineral exploration and development is permitted within the Natural Zone on existing mineral claims. Natural values will be affected to the extent that exploration and development does occur in the Natural Zone. It cannot, however, be evaluated by option and thus mineral exploration and development is not addressed in the following summary.

> Option 1 has the greatest impact on wildlife and aquatic resources. As the existing wilderness values are foregone in this option, the opportunity to use and enjoy wildlife and marine resources in their natural environment are also foregone. Habitats are dramatically affected. Marine and terrestrial ecosystems and the species that inhabit them are affected by the scale and type of development implied by this option.

Option 2 includes the area south of Burnaby Narrows in the Natural Zone and would therefore protect all wildlife and aquatic values south of that area. Because of the relatively high density of values in this southern area, this option protects about half of the known seabird colonies, half of the identified fish streams and a significant representation of the marine ecosystems. It includes protection for such important wildlife areas as Burnaby Narrows, Skincuttle Islands, Houston Stewart Channel and Kunghit Island.

It does not, however, protect a concentration of values in Juan Perez Sound, including the highest concentration of falcon eyries in South Moresby. Ramsay Island, in particular, has several major seabird colonies and is included in the Development Zone. These colonies would be potentially affected by logging on Ramsay Island. Several major fish streams and important marine areas in Juan Perez Sound and Darwin Sound are included in the Resource Development Zone and would be subject to the impacts of development.

OPTION 3 includes the area south of Lyell Island in the Natural Zone and thus protects most of the identified wildlife and marine values of the South Moresby area from the impacts of development. This reflects the relatively higher density of values in the southern portion of the study area. Lyell Island and the Darwin Sound area include a number of important fish streams which would be subject to the Resource Development Zone under this option. However, most streams would be protected.

OPTION 4 provides the most protection to the natural values identified in South Moresby. However, because of logging on Lyell Island, this option does not afford complete protection to natural values.

5.2 Cultural Heritage Evaluation

5.2.1 HERITAGE SITES

Clearly, many archaeological sites comprising Haida use of the forests such as canoes, bark-stripped trees, and test-holes can be destroyed by harvesting, simply because they are in stands of merchantable timber. The remaining buried sites can be destroyed by any disturbance of the soil and are prone to destruction by logging, mining, tourism and other forms of development as well as natural degradation. Among these forms of development, logging ranks highest in destructive potential through the agencies of mass wasting, camp and road construction, and yarding. Mining ranks second due to the smaller land area usually involved. Tourism ranks third due to natural curiosity and relic-hunting (both of which can be reduced through public education and awareness programs).

There was unanimous agreement among team members that all buried sites will be protected. It remains to be determined how this can be done. The status and protection to be afforded to sites of Haida forest use also remains to be determined. The present inventory is inadequate and no responsibilities have been assigned for funding of further reconnaissance. The present interagency referral system is also inadequate, even for the protection of known sites. Finally, policing is virtually nonexistent and charges are infrequently laid. Thus, it is difficult to see how site protection can be effectively carried out without some changes in present policies.

Even with policies reworked to alleviate some of the problems, archaeological site protection will only be improved by degrees. It is safe to say that archaeological sites will fare progressively better when they are not in the proximity of logging, of mining, or of tourism. The inclusion of archaeological sites or potential archaeological lands within a Natural Zone designation, does in fact afford the sites a form of protection that they would not otherwise have. This is particularly true of sites which have not yet been inventoried. Therefore, moving progressively from Option 1 through Option 4, substantially more protection is afforded to heritage sites. Option 4 would clearly provide maximum protection.

Table 21 lists various measures of sites over the options. The first shows the number of currently registered archaeological sites thus protected under each option. The second measure shows the number of probable sites, and is an extrapolation based on the estimated degree of completeness of the existing inventory, taken as the average of the two coasts or 25 percent. The third shows the shoreline distance which should to some extent determine site distributions. A remarkable correlation of shoreline distance with registered distribution is evident, and tends to confirm the frequencies of occurrence. The fourth measure of mature cedar forest cover should give an approximation of the expected distribution of Haida forest use sites.

TABLE 21: Archaeology Site Protection for South Moresby Land Use Options

Measure/Option	1	2	3	4	All of South Moresby
Registered Sites (#)	31	77	91	105	113
Registered Sites (%)	27	68	80	93	100
Probable Sites (#)	124	308	364	420	452
Probable Sites (%)	27	68	80	93	100
Shoreline (km)	267	562	649	797	841
Shoreline (%)	32	67	77	95	100
Mature Cedar (ha)	670	3295	3817	5425	6674
Mature Cedar (%)	10	49	57	81	100

5.2.2 ART

Impacts of the options upon art activities in South Moresby are assessed in a qualitative sense only.

Art commodities already in the marketplace would probably be unaffected by choice of management option. The extent to which future art production may or may not be impacted by industrial activity as introduced by the range of options remains to be considered.

Fine arts graphic production will be affected according to the artists' attraction to South Moresby because of its wilderness values. Of the seven professional artists interviewed, two maintained that, wilderness issues aside, artistic inspiration is adaptable to any scenario, and in fact occasionally encompasses industrial activities. The other five artists hold the opinion that their interest in South Moresby would diminish in direct ratio to an increase in industrial activity.

As explained in Section 3.2.2, the Haida cultural heritage is intrinsically tied to South Moresby as a wilderness. Haida artists are frequent visitors to the area and are uncompromising about the impacts of potential industrial development. A pristine South Moresby is essential to Haida cultural well-being and hence to their artistic inspiration. Industrial activity, therefore, may severely diminish Haida cultural expression. The Haida culture contains an unusually high proportion of artists, a fact which is compounded in part by an employment environment where the arts offer a major economic opportunity. To this extent, the potential consequences of the loss of the South Moresby wilderness to Haida culture are especially destructive.

The impact of the options on publications and film productions is somewhat less straightforward, due to the wide range of interests which come to bear upon South Moresby. Obviously, scientific papers and productions which focus on natural values and recreation will be stimulated by greater degrees of wilderness conservation. Similarly, productions which examine the impacts of resource extraction in South Moresby, including the present allocation controversy, will probably be stimulated by greater degrees of industrial development.

In general, it can be concluded that the bulk of artistic activity in South Moresby is attributable to its wilderness character. It can also be seen that the economic and cultural ramifications of this activity are far more substantial and wide-ranging than a superficial consideration would indicate. The cultural assets of South Moresby, and its capacity to provide future inspiration and economic activity, are considerable. It is important to recognize the value and implications of this fact, especially in a process of deciding whether such an area will remain intact or be subject to the changes wrought by resource extraction industries.

5.3 Wilderness and Recreation Evaluation

The following is an evaluation of the impacts of each option on the existing wilderness and recreation values of the study area. The evaluations are subject to some degree of uncertainty depending upon the ultimate nature of resource management prescriptions on a site specific basis. Specifically, forest or mineral development in Resource Development Zones may affect recreation values in an adjacent Natural Zone to varying degrees depending upon the timing of development and the degree to which development can or cannot be screened from recreation use areas. For the purposes of this evaluation it is assumed that activities in portions of Resource Development Zones adjacent to key features of Natural Zones will be managed to minimize their impact while still recognizing the objectives of the overall Resource Development Zone. It is also assumed that key site specific recreational features will be protected in Resource Development Zones.

Another area of variability stems from existing mineral claims in Natural Zones. For the purposes of this evaluation it is assumed that the impacts of exploration activities will be minimized. The possibility of a mine being developed remains unknown.

> Option 1 - The objective of Option 1 is to maintain and permit future development of extractive resource use in the study area while public use of three core recreation areas is encouraged and protected. As such, existing wilderness values are largely foregone. Key characteristics of wilderness - lack of the marks of contemporary man, sense of distance from civilization and the opportunity to experience travel through a contiguous wilderness area - are not available through most of the study area. Two small (relative to other options) non-contiguous regions of wilderness are retained on the west coast. These areas are rugged remote west coast landscapes that represent limited but high-quality wilderness opportunities for the very experienced. With the exception of Anthony Island, current use of these areas is very low due to hazardous access.

As with wilderness values the proportion of existing recreation features afforded complete protection is limited in Option 1.

Only a very small portion of the east coast which accommodates the majority of existing region recreational use, is designated Natural Zone. The key impact on existing recreation value is the loss of opportunity to travel through natural environments and to enjoy recreational focal points with a completely protected background or setting. Specific sites protected are the Hotspring Island/De La Beche Inlet area and Burnaby Narrows, which are considered the two highest value recreation focal points of the east coast region. Both areas are, however, subject to potential impacts of existing mineral claims.

The San Christoval Mountains region is also afforded very little area of complete protection in Option 1. One area (approximately 15 percent of the length of the range) at the head of De La Beche Inlet is designated as Natural Zone providing some opportunity for short route alpine hiking in a protected setting. Opportunities for a major north-south hiking route are subject to potential impacts from resource development.

The Anthony Island region and its immediate setting are afforded complete protection in Option 1. The area would likely remain a key recreational feature of the Queen Charlotte Islands, although without the associated opportunities to travel to the area through a natural environment its value would likely be diminished.

The west coast region receives the main focus of recreation protection in Option 1. Approximately 65 percent of the length of the coast is designated Natural Zone. Although the opportunity for a contiguous west coast trip in a completely protected setting is not ensured the majority of site-specific recreation features are protected.

The existing levels of recreational use and potential for further growth of use would be heavily impacted in Option 1. At the present time the majority of recreational use in the study area is based upon a recreational experience that incorporates both contiguous wilderness along with visits to special attractions. In Option 1 this type of value is largely foregone. Although there is no way to quantitatively measure the effect of such impact it is expected that the commercial recreation industry and off-island visitor activity in particular, would be greatly reduced.

Option 2 - The objective of Option 2 is to effect a balance of land use by geographically separating resource development and Natural Zones to the north and south respectively, while managing for one recreation core within the resource development area.

As such, the concept of a complete wilderness in the study area is foregone. Existing wilderness values are protected in the southern half of the study area's east coast and on the study area's west coast. The lands protected are the more remote parts of the study area offering the greatest sense of seclusion at the present time.

Option 2 does provide a larger degree of protection to recreation features. Approximately one-half of the east coast region and its recreation values are afforded complete protection. Key features of Hotspring Island/De La Beche Inlet and its immediate visual setting and all features from Burnaby Narrows south are protected subject to potential impacts of existing mineral claims. There is extensive opportunity to travel through a natural environment in the south. The area to the north with its greater variety of routing alternatives (and therefore the ability to absorb more users) is not protected.

The San Christoval Mountain region is afforded protection for approximately 50 percent of its length in Option 2.

The recreational features of the Anthony Island and west coast regions are afforded complete protection.

The existing levels of recreational use in the study area would likely be impacted to a degree by Option 2. With the total area of existing wilderness travel activity reduced to approximately one-half, it is expected that existing use may be diminished to some degree and compacted into the protected area. In addition, the increased travel distance to the protected area from road access points to the north would reduce use levels. The ultimate potential for this type of use proportional to the area of opportunity lost would therefore be reduced. The area would likely remain a tourist attraction but be reduced in size and potential value of use. The potential for growth of use on the west coast is unknown.

Option 3 - The objective of Option 3 is to protect a significant portion of the study area as Natural Zone with a geographical separation of Resource Development Zone to the north and Natural Zone to the south.

As such, wilderness values are emphasized but reduced from current size. On the east coast the wilderness values of all areas from Burnaby Narrows south are protected, with the Juan Perez Sound area (including the Hotspring Island/De Le Beche Inlet area) acting as a buffer between the wilderness to the south and resource development to the north. Wilderness values of Juan Perez Sound itself would be partially protected dependent upon timing and degree of impact of resource development on south Lyell Island. Wilderness values on the west coast would be protected.

Option 3 provides major protection of the study area's recreation features.

Most of the east coast region's key recreation features are afforded complete protection. The largest impact of this option is the loss of opportunity to travel through the northern part of the study area (with its variety of routing alternatives) in a natural setting.

The San Christoval Mountain region's recreation features are afforded complete protection for approximately 80 percent of its length providing opportunity for a major alpine hiking route.

The features of the Anthony Island and west coast regions are afforded complete protection.

The existing levels of recreational use in the study would likely be modified but not to a large degree in Option 3. A significant portion of existing users pass through the Resource Development Zones northern part of the study area as part of a visit to South Moresby but do not focus on this area as a major recreational attraction (Windy Bay may be an exception to this). Existing wilderness values of Juan Perez Sound are compromised in this option but likely not to a degree that would seriously displace existing use from the area.

The potential for growth of recreational use of the study area would likely not be greatly reduced in this option.

Option 4 - The objective of Option 4 is to establish a wilderness in the study area with the exception of areas of Lyell Island currently being logged.

As such, existing wilderness values are retained largely as described in section 3.3 of this report. The majority of the east coast and all of the west coast of the study area would be managed as a wilderness subject to potential impacts of existing mineral claims.

Existing recreation features would be afforded protection in all areas.

The current levels of recreation use and potentials for future use as described in Sections 3.3 and 3.3.4 of this report would be retained.

5.4 Fisheries Freshwater Habitat Evaluation

An evaluation technique was applied to quantitatively describe the relative hazard that each of the three resource development oriented options (Options 1, 2, 3) would present to the freshwater salmonid fish habitat. Although some degree of resource development does occur within Option 4, the same level of development is possible regardless of any option selected. For evaluation purposes, impacts upon fisheries freshwater habitat resulting from such resource development can be considered constant throughout all options and has therefore been deleted from this analysis. This entails comparing the differences in magnitude of impacts derived from each option.

There is no suggestion that predicted damage would occur to fish habitat; rather, the technique was applied to rank and quantify each of the three options in terms of risk on freshwater salmonid fish habitat. Realized potential impacts include damage to fish habitat which may be caused by long-term chronic factors (such as increased sedimentation of river bed gravels) or sudden events which may be induced by industrial activities (e.g., mass-wasting). This evaluation is concerned with potential forest harvesting impacts. Mining and other forms of industrial development were not considered due to the impossibility of determining their future locations and extent.

The option evaluation technique first involved itemizing streams within the Resource Development Zone prescribed by each option. Those streams defined within the development zone of Option 4 were considered constant for each option and were not evaluated. Also, streams which would not be influenced by any resource development option (those drainages which do not support operable timber) were not evaluated. After the exclusion of these streams, the fifty-six streams identified within South Moresby were reduced to twenty-five for evaluation purposes (Table 22).

Streams were then divided into length segments ("L") of constant planning characteristics based on homogeneous considerations (gradient, channel configuration, etc.) and assessed individually for each option by assigning an arbitrary point value scheme in terms of the following parameters:

i.	Industrial Potential:	- non-developable - developable
ii.	Planning Treatment:	- Natural Zone - Resource Development Zone
iii.	Local Concerns:	- water quality - anadromous fish present
iv.	Slope Stability:	- stable - unstable
v.	Stream Sensitivity:	- non-sensitive - sensitive (e.g., meander, braided)

A total point value ("T") could then be obtained for each stream segment by summing individual parameter values. As such, streams which are sensitive to development by the nature of complex flow patterns or slope instability yielded a high score. Stream segments with no developable industrial potential or which were described within a Natural Zone yielded a total value of zero for that segment regardless of consideration of the other parameters.

Individual stream segments were then normalized by applying an adjustment factor ("k") which categorized the stream productivity into three groups, as estimated by the six-year average of pink and chum salmon escapement only. Although coho salmon escapement data is generally unreliable and therefore was not utilized in this analysis, freshwater habitat requirements and distribution for this species is known and was incorporated into the point value assessment for each paramemter mentioned above.

Accordingly, a value could be derived for each stream segment, where:

stream segment value = (L) X (k) X (T)

TABLE 22: Summary of Stream Impact Potentials on Salmon Streams for South Moresby Land Use Options

Index* No.	k** Stream	Length*** Value	Utilized	Derived Impact Values		
				Option 1	Option 2	Option 3
9.	Sedgwick	3	0.8	12.6	12.6	12.6
10.	Anna	1	0.4	2.1	2.1	2.1
11.	Salmon	3	2.4	17.4	17.4	7.4
12.	Echo Harbour	2	2.3	9.2	9.2	9.2
13.	Kostan	2	0.6	5.0	0	0
14.	Hutton (head)	3	2.4	3.6	3.6	0
16.	Marshall Inlet	3	2.0	31.8	31.8	0
19.	Arrow	1	0.3	4.1	4.1	0
21.	Skatt Harb. (S)	2	1.0	11.4	11.4	0
22.	Skatt Harb. (SE)	3	0.4	1.8	1.8	0
30.	Huston Inlet	3	0.8	7.8	0	0
31.	Jedway	2	0.4	6.0	0	0
32.	Harriet	3	0.8	4.8	0	0
33.	Ikeda	3	2.5	19.8	0	0
34.	Collison Bay	2	0.8	5.8	0	0
36.	South Cove	2	0.8	2.3	0	0
37.	Koya	2	1.6	2.4	0	0
38.	Raspberry	1	1.5	4.9	0	0
39.	Sedmond	3	1.2	18.3	0	0
41.	Louscoone	3	2.5	16.2	0	0
47.	Alder Island	2	0.4	7.7	7.7	0
48.	Scudder Point	3	2.5	26.1	13.1	0
49.	Poole Inlet (S)	2	0.2	4.2	0	0
50.	Poole Inlet (W)	2	0.2	1.3	0	0
55.	Heater	2	1.2	6.8	0	0
Total				233.4	114.8	31.3
% Reductions Based on Option 1:					51%	87%

* Index numbers refer to Table 3 and Figure 11

** k-value = number group of returning salmon.

1 = 2 - 250
2 = 251 - 1,000
3 = 1,001 - 50,000

*** total length (km) of stream utilized as salmon habitat

Thus, the total of all individual segment values will yield the total value for that stream relevant to the option under consideration (Table 22).

The results shown indicate an increasing potential for impact on the freshwater salmonid fish habitat of those streams analyzed in relation to increasing emphasis on resource development. As previously explained, no potential exists for such impact on these streams within Option 4, over the status quo.

Prior to this planning process, resource development within South Moresby with its inherent concomitant impacts upon freshwater salmonid habitat would have proceeded more or less along present-day standards. Although some Natural Zone designation does occur within Option 1, this option can be designated as the established status quo for this planning process. Any provisions for the conversion of additional land base which also contains streams supporting freshwater salmonid habitat to a Natural Zone designation can be construed as a net gain with regards to the protection of this same habitat from any realized impacts. From the derived impact values given in Table 22, it is found that the potential for impact on freshwater salmonid fish habitat for Option 2 is 51 percent lower than Option 1, while for Option 3 is 87 percent lower than Option 1. Obviously, the value for Option 4 will be 100 percent lower than that of Option 1.

5.5 Timber Resource Evaluation

The timber resource evaluation is an assessment of the timber-related impacts of the land use options, organized into three categories of analysis.

i. Timber Resource Analysis. This section examines the immediate alterations to the physical land base and the corresponding implications for the rate of harvest, both in the short and long term. These reductions are expressed in the following parameters: net operable area and volumes, allowable annual cut (A.A.C.) and long run sustained yield (L.R.S.Y.).

ii. Economic Analysis. The reductions in available volume and harvests described for each option imply corresponding reductions in economic activity. The economic analysis is an expression of the economic impacts of reserving productive forest land and withdrawing resources from forestry use.

The parameters of impact in this analysis correspond to the values described in Section 3.5.3.

a) Net value of standing timber

b) Provincial revenues

c) Employment

d) Employment income

e) Value of forest products

iii. Compensation. The FOREST ACT provides the authority under which the Ministry of Forests may delete land or curtail rights that have been granted by virtue of various types of forest tenure. While there is no limitation on the magnitude of deletions that can be made, the ACT provides for the compensation of licensees for deletions made beyond specified limits, during specified time frames. The determination of compensation depends on the specific type of tenure involved. Estimates of the magnitude of compensatable deletion have been prepared for the area based T.F.L. and Timber Licences.

The actual monetary cost to the province resulting from compensation in cash has not been assessed. The issues surrounding compensation are matters to be resolved in detail only after a land use decision has been made.

The impacts described in this evaluation are with reference to the South Moresby land use options only. There would be additional impacts should either of the Windy Bay ecological reserve proposals be selected.

5.5.1 TIMBER RESOURCE ANALYSIS

Net operable forest land base data was assembled in order to evaluate the impacts of the options on available timber. For each option, all forest land falling within Natural Zone was assumed to be unavailable for timber harvesting and management. This data was used to prepare estimates of area, volume and rate of harvest reductions.

Forest Land Base

The net operable forest land base in South Moresby is summarized as follows:

T.F.L. 24; Bks. 3,4,5	30 000
Q.C. T.S.A.; South Moresby Supply Block	2 428
M.B. Timber Licence	825
South Moresby total	33 253

Eighteen percent of the total area is immature, with the remainder in mature forest. Reductions from this land base for the South Moresby land use options are summarized in Table 23, and illustrated in Figure 23.

The total net operable mature volume in South Moresby is approximately 20 000 000 m^3. The volume distribution corresponds to the area distribution between the T.F.L., the T.S.A., and the M.B. Timber Licences. Table 24 and Figure 24 summarize the mature volume loss resulting from the land withdrawals of the South Moresby options.

TABLE 23: Net Operable Area Reductions For South Moresby Land Use Options

	ha. Option 1	Option 2	Option 3	Option 4
T.F.L. 24 Bks. 3, 4, 5	561	10 507	14 871	20 672
% Reduction from Bks. 3, 4, 5	2%	35%	49%	69%
Q.C. T.S.A. South Moresby Supply Block	299	415	1 566	2 428
% Reduction from Supply Block	12%	17%	64%	100%
M.B. Timber Licences				680
% Reduction from M.B. T.L.'s				82%
South Moresby	860	10 922	16 437	23 780
% Reduction from South Moresby	3%	33%	50%	72%

Figure 23 Net Operable Area Reductions for South Moresby Land Use Options

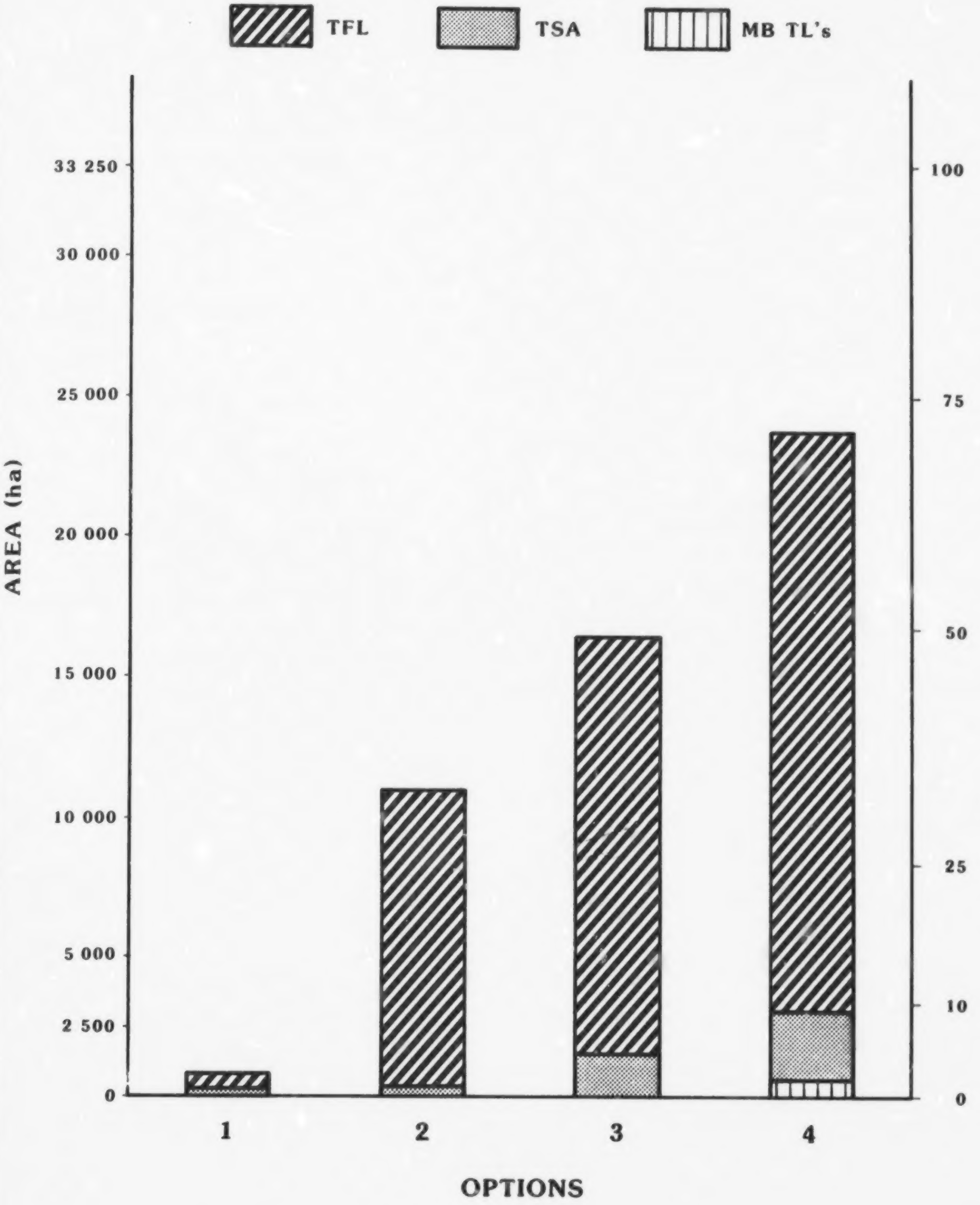
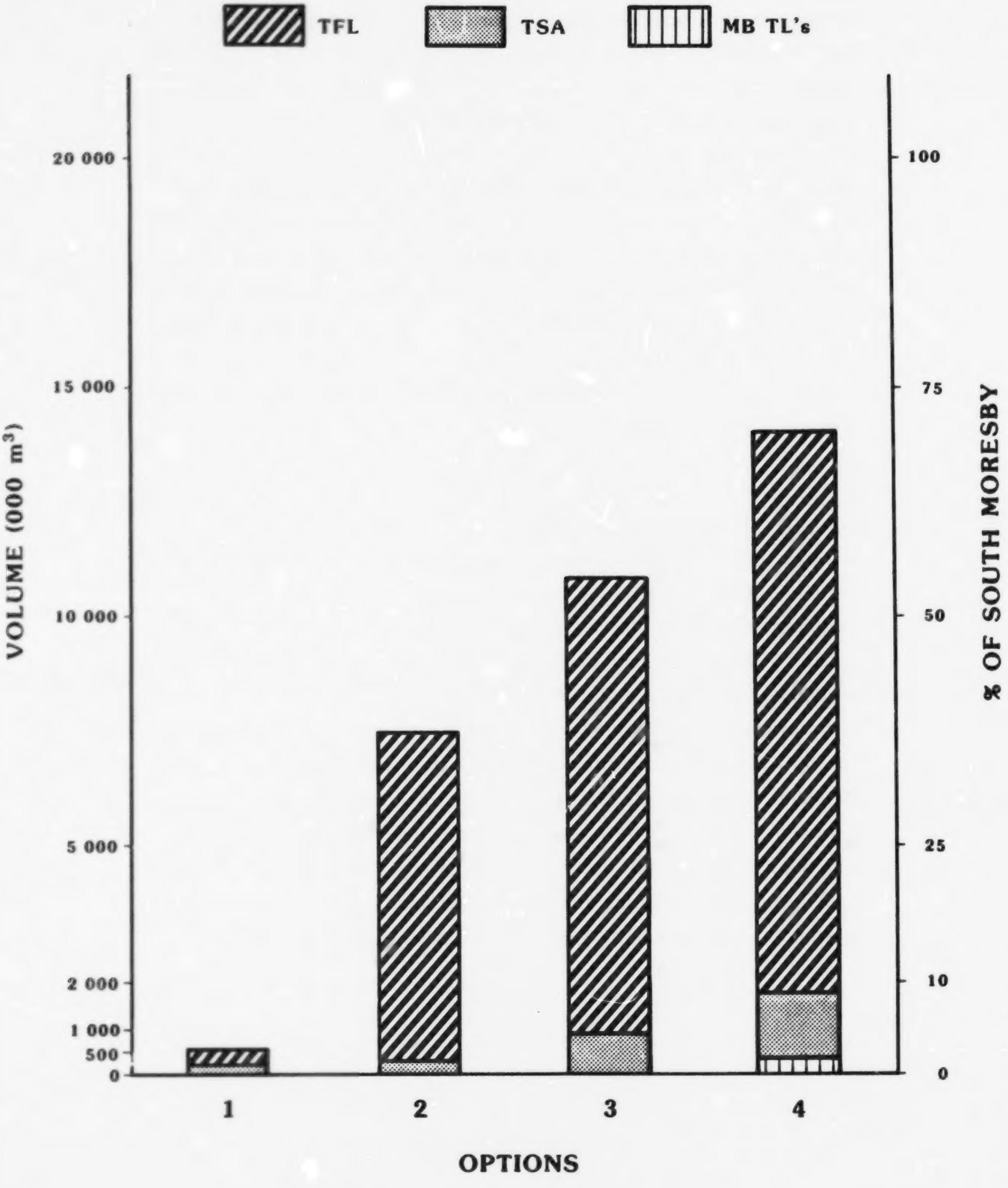


TABLE 24: Net Operable Mature Volume Reductions for South Moresby Land Use Options

	'000 m^3			
	Option 1	Option 2	Option 3	Option 4
T.F.L. 24 Bk. 3-5	285	7 232	9 987	12 793
% Reduction from Bk. 3-5	2%	40%	56%	72%
Q.C. T.S.A. South Moresby Supply Block	261	330	913	1 441
% Reduction from South Moresby Supply Block	18%	23%	63%	100%
M.B. Timber Licences				413
% Reduction from M.B. Timber Licences				77%
South Moresby Total	546	7 562	10 900	14 647
% Reduction from South Moresby	3%	38%	55%	74%

Figure 24 Net Operable Volume Reductions for South Moresby Land Use Options



Rate of Harvest

The area and volume reductions described from each option would ultimately be translated into a reduction in the rate of harvest. These reductions have been estimated separately for the T.F.L., the T.S.A., and the Timber Licences, and combined into a total for each land use option. The rate of harvest impact is an estimate of the magnitude of reduction in the level of harvest which would result from implementation of the Natural Zone. This reduction is measured with reference to a level of harvest which may be sustained on the existing land base, all other conditions being equal. It is emphasized that the rate of harvest impacts generated in this report are not necessarily impacts to the currently approved allowable annual cuts (A.A.C.s) for the T.F.L. or T.S.A. The rate of harvest impacts are technical estimates only. An approved A.A.C. is a selected (rather than calculated) rate of harvest; although based on technical considerations it is essentially a management decision.

T.F.L. 24

The rate of harvest impacts for the T.F.L. 24 portion of the South Moresby land use options were determined using the Multiple Use Sustained Yield Calculation (MUSYC) program. The MUSYC analysis calculated an optimal harvest for each of the options as well as for the T.F.L. The option land bases modelled correspond to the T.F.L., including Blocks 1 and 2 north of the study area, less the areas withdrawn in the Natural Zone. The harvest schedules produced for the options were constrained only by the rule that harvests be sustained for 70 years, the same length of time that the currently approved A.A.C. may be maintained, with the additional requirement that the harvest not fall below L.R.S.Y. at any time. Beyond that the model sought to maximize volume for each land base through efficient scheduling of harvest. The T.F.L. 24 land base was modelled in a similar manner, without the upper bound of the currently approved A.A.C., to produce a T.F.L. base run. The base run indicated that the comparable optimal baseline harvest for 70 years was 441 800 m^3. The harvest schedules from the MUSYC analysis are illustrated in Figure 25.

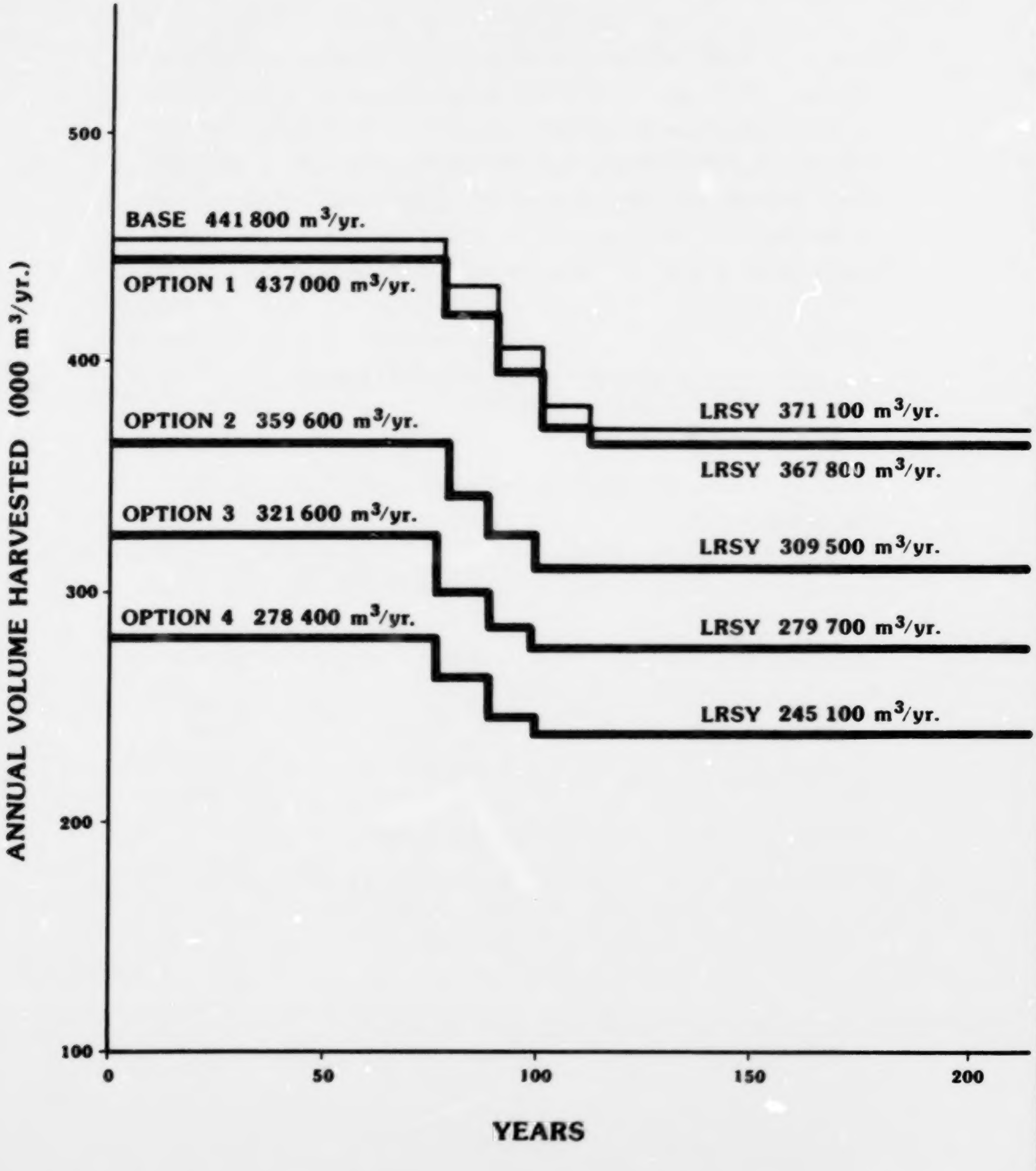
These optimal harvest levels reflect maximum flexibility in scheduling harvests, and do not account for basic reductions to the current A.A.C. for general enviromental protection. Such factors can not be evaluated on a site specific basis for each land use option. The final estimates were therefore produced by applying the optimal rate of harvest reduction as a percentage of the baseline to the current A.A.C. The results of the entire exercise are summarized in Table 25.

TABLE 25: Impacts of South Moresby Land Use Options on T.F.L. 24 Rate of Harvest

m^3/yr.

	Option 1	Option 2	Option 3	Option 4
Rate of Harvest:				
Reduction of optimal T.F.L. harvest (MUSYC Analysis)	4 800	82 000	120 200	163 400
% Reduction	1.1%	18.6%	27.2%	37.0%
Reduction based on approved A.A.C.	4 760	80 420	117 610	159 980
Long Run Sustained Yield:				
Reduction to L.R.S.Y.	3 240	61 570	91 370	125 960
% Reduction	0.9%	16.6%	24.6%	33.9%

Figure 25 Simulated Reductions to TFL 24 Rate of Harvest for South Moresby Land Use Options



T.S.A.

In the absence of complete yield analyses for the T.S.A. for each of the South Moresby options, the contribution to Long Run Sustained Yield is presented as a measure of the impact to the rate of harvest. These measures must be considered conservative when used as estimates for the short-term impacts. The L.R.S.Y. calculated for the T.S.A. is less than 57 percent of the current A.A.C. for the unit. The actual short-term impacts could therefore be 25 to 40 percent higher than the L.R.S.Y. figures listed below.

TABLE 26: Impacts of South Moresby Land Use Options on Queen Charlotte T.S.A. Rate of Harvest

m^3/yr.

	Option 1	Option 2	Option 3	Option 4
(L.R.S.Y.)	1 550	2 120	6 760	11 200
% Reduction of Supply Block C	14%	20%	60%	100%
% Reduction of T.S.A.	0.6%	0.8%	2.6%	4.5%

Timber Licences

The licence on NE Lyell Island is included in the Resource Development Zone in all four of the South Moresby land use options. A portion of this licence could, however, be deleted as part of Windy Bay ecological reserve proposal Option A. A rate of harvest impact has not been estimated for that withdrawal.

The remaining three licences would remain available for harvest in all land use scenarios, except for Option 4. The total volume of the licences harvested over the 14-year period from 1991 to 2005 would result in an average rate of harvest of 30 000 m^3/yr. However, a rate of harvest reduction of 11 600 m^3/year has been used to combine the Timber Licence withdrawals with those in the T.F.L. and the TSA in a similar context of a 70-year time frame. This latter figure would be low if used to express the actual reduction in the short term.

Following liquidation the Timber Licences would revert to the Crown, and the areas would subsequently contribute to the L.R.S.Y. of the T.S.A. The L.R.S.Y. contribution would amount to approximately 5 400 m^3/yr.

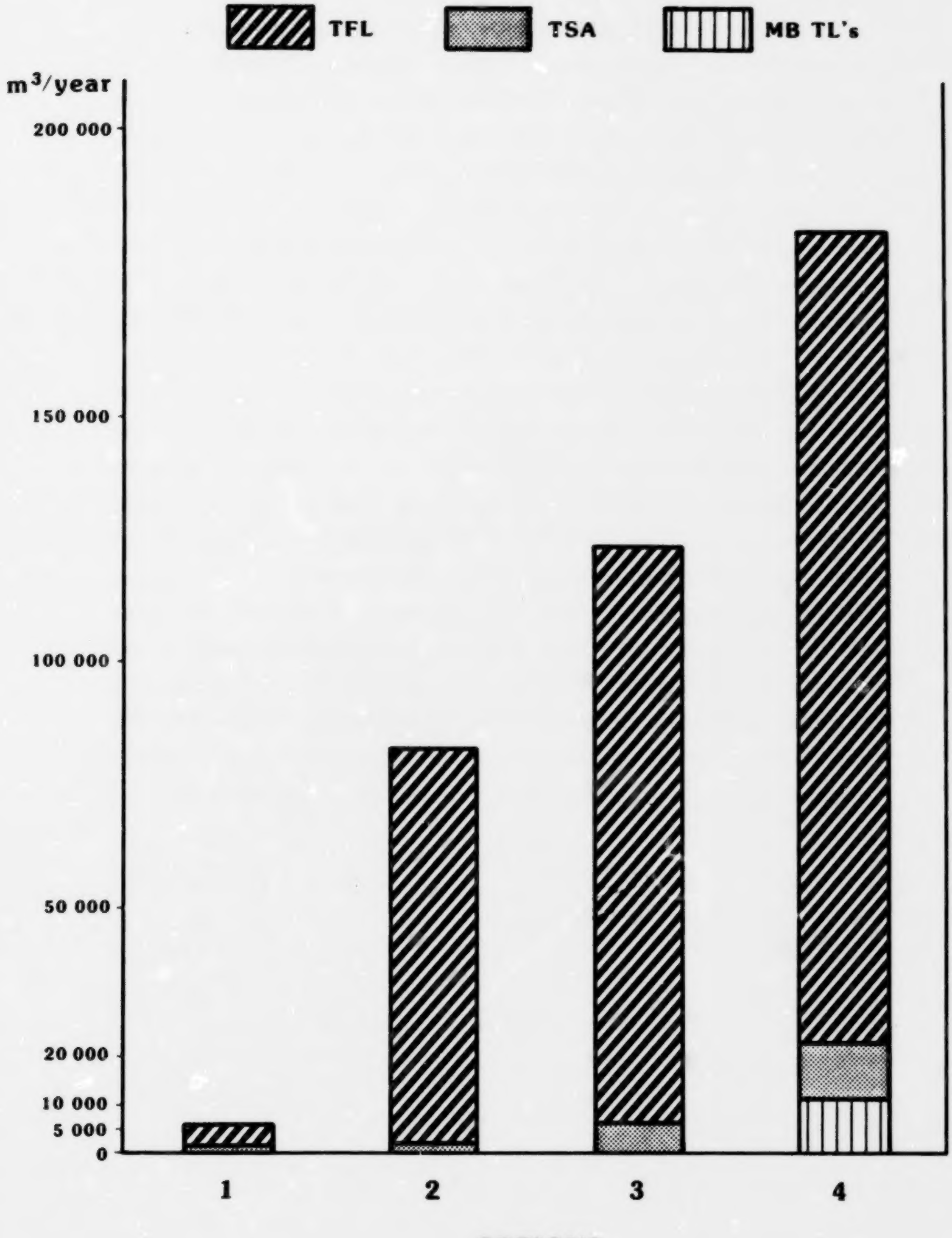
Summary

The total rate of harvest impacts of the South Moresby options are summarized in the following table, and illustrated in Figures 26.

TABLE 27: Summary of Impacts of South Moresby Land Use Options on Rate of Harvest

	m^3/yr.			
	Option 1	Option 2	Option 3	Option 4
Rate of Harvest:				
T.F.L.	4 760	80 420	117 610	159 980
T.S.A.	1 550	2 120	6 760	11 200
MB TL's				11 600
Total	6 310	82 540	124 370	182 780
Long Run Sustained Yield:				
T.F.L.	3 240	61 570	91 370	125 960
T.S.A.	1 550	2 120	6 760	11 200
MB TL's				5 400
Total	4 790	63 690	98 130	142 560

Figure 26 Summary of Rate of Harvest Reduction for South Moresby Land Use Options



5.5.2 ECONOMIC ANALYSIS

Introduction

A certain level of economic activity is associated with the South Moresby timber harvest contribution, as discussed in Section 3.6.3. The economic analysis is an evaluation of the reductions in economic activity which correspond to the rate of harvest reductions projected for the land use options. These reductions are measured from the perspectives of revenues to the province which are attributable to harvesting and processing, employment and employment income generated from harvesting and processing, and the end product value. Section 3.6.3 provides a description of how these measures are derived.

The analysis is presented as an impact assessment rather than a formal cost-benefit analysis as defined by provincial guidelines (British Columbia, 1977). No attempt has been made to incorporate benefits which may be derived from land uses other than commercial timber production. The employment, income and provincial revenue reductions are therefore treated as losses with reference to timber supply only. In addition, the effects of time have not been addressed through discounting or other methods. The values presented in this analysis are all annual measures. This analysis simply represents a selection of various perspectives considered to be relevant to the economic issues of timberland withdrawal. These are disparate viewpoints and are in no way additive to each other.

Interpretation

There is a considerable amount of uncertainty surrounding any description of economic impact. The expression of impacts greatly depends on the assumption used in the exercise. If any of these assumptions should not apply in reality, then the impact will in like measure be inaccurate. In addition it has not been possible to account for all the many variables which will influence how changes in land use are felt. The following describes the underlying assumptions which guide the analysis, and the qualifications which apply to the interpretation of results.

Several assumptions underlie the treatment of timber values and rate of harvest, which in turn influences the structure of the analysis. The first is that timber values in the T.F.L., T.S.A. and M.B. Timber Licences are for the most part equivalent. Second, although there are presently no active operations in the T.S.A. portion of South Moresby, the contribution to the harvest is realized elsewhere in the T.S.A. Therefore any further reduction in the level of harvest will have corresponding economic and social costs even if the impact originates outside the study area. A final assumption is that the company and industry response to a reduced timber supply from South Moresby must ultimately be a reduction in employment and output, however manifested. Alternative responses such as log purchases to replace supply shortfalls are not examined, nor are they considered viable in the long run.

All of the annual impacts correspond to the rate of timber harvest determined in Section 5.1.1. This approach reflects an immediate reduction, and is only one scenario regarding the adjustment of harvest rates. While it is clear that a land withdrawal will require some kind of reduction in the rate of harvest, the timing and level at which it is set can not be determined through analysis. It may be possible to defer some of the anticipated reduction for a certain period of time, or implement a 'phase down' approach to the adjustment. However, current Ministry of Forests policy indicates that at least some adjustment must shortly follow formal land withdrawal. In addition, there is some question as to whether the FOREST ACT will permit delayed reductions or a protracted phase down on Tree Farm Licence tenures. In any event, the total impact on available timber will be more or less equal regardless of when these impacts are scheduled to occur.

It must be emphasized that very little can be determined about how, when and over what period of time impacts generated in this analysis may be expected to occur. The uncertainty of impacts expressed on an annual basis increases as they are projected further into the future. Employment impacts which are not extensive may be manifested more as a reduction in the rate of growth in the industry rather than in immediate job losses. In addition, there are a number of long-run adjustments which will influence the extent of the impacts. Unemployed labour is likely over time to be employed elsewhere depending on the existing opportunities, mobility of labour, and the reinvestment of capital in the province. Net job losses to the province will therefore occur only to the extent that opportunities do not arise in other sectors. However, within the forest industry, the relationship of employment to harvest is clear. Regardless of whatever adjustments may be made in the economy the forest industry is in the long-run constrained by the available timber supply.

A final note concerns compensation made by the province to licensees for land withdrawal and its role in long-run adjustments. Within the framework of company operations, economic impacts will be offset to the extent that compensation is provided. If compensation is in the form of an alternate timber suppy, the ensuing displacement of other potential or existing operators would result in corresponding economic impacts being experienced elsewhere. Alternatively, compensation in cash could be a source of investment capital for the creation of jobs and revenues. The cash settlement would represent a transfer payment from the Provincial Treasury, and a net loss to the province. In either case, the application of compensation provisions do not significantly distort the magnitude of impacts on a provincial scale.

EMPLOYMENT

TABLE 28: Forest Sector Employment Reductions for South Moresby Land Use Options

	Option 1	Option 2	Option 3	Option 4
	manyears			
Harvesting and Forest Management Sector	3	35	52	77
Wood Processing Sector	6	70	104	154
Total	9	105	156	231

The social costs resulting from the timber harvest reductions are measured in terms of impacts on employment. The reductions expressed in manyears represents equal units of employment, based on harvesting productivity of T.F.L. 24. These figures would be higher if derived using data on coastal averages.

There would be additional reductions to indirect and induced employment. The magnitude of these reductions has not been determined.

EMPLOYMENT INCOME

TABLE 29: Employment Income Reductions for South Moresby Land Use Options

	Option 1	Option 2	Option 3	Option 4
	$			
Harvesting and Management	119 900	1 558 700	2 398 100	3 756 900
Wood Processing	208 200	2 723 800	4 104 200	6 031 700
Total	328 100	4 282 500	6 502 300	9 788 600

There will be additional employment income losses to the indirect and induced employment, though no estimate of this total loss has been made. The average wages for persons associated with this employment is estimated to be 80 percent of the forest industry average.

PROVINCIAL REVENUES

TABLE 30: Reductions to Provincial Revenue for South Moresby Land Use Options

			$		
	Value/m^3	Option 1	Option 2	Option 3	Option 4
1. Stumpage	13.37	83 400	1 103 600	1 662 800	2 443 800
2. Annual Rent	.45 T.F.L.	2 100	36 100	52 900	72 000
	.15 T.S.A.	200	300	1 000	1 700
3. Corporate Income Tax	1.20	7 600	99 000	149 200	219 000
4. Logging Tax	.80	5 000	66 000	99 500	146 200
Total		98 300	1 305 000	1 965 400	2 882 700

The above figures do not include the loss of \$3.70/m^3 of social services and personal income taxes which would also apply to some extent.

VALUE OF FOREST PRODUCTS

TABLE 31: Reductions to Annual Value of Forest Products for South Moresby Land Use Options

	Option 1	Option 2	Option 3	Option 4
Value of Final Product(\$120/m^3)	757 200	9 904 800	14 924 400	21 933 600

Harvesting Rights

In addition to the market value of the timber, there is a further economic value foregone when forest land is withdrawn from a T.F.L. insofar as that land contributes to the harvesting rights of the licence. The relatively secure, long-term rights embodied in a T.F.L. agreement can have considerable value to the licensee which is lost when all or a portion of these rights are relinquished. Due to the difficulty of determining the market value of the rights by themselves, no attempt has been made in this analysis to quantity that value in dollar terms. However, it should be noted as an additional item of value.

5.5.3 COMPENSATION

The provisions for the deletion of Crown land and reduction of harvesting rights from forest tenures are outlined in Section 53 of the FOREST ACT. It specifies that deletions and reductions apply whenever alterations are made to the use of the forest land base for purposes other than timber production. The management strategy for the Natural Zone therefore requires that land withdrawals be made to the T.F.L. and the Timber Licences in South Moresby, with a corresponding reduction in rate of harvest. Section 53 also establishes the limits beyond which such deletions are compensatable, and provides the basis for estimating both the magnitude of deletion and compensatable portion. The methodology and estimates for the area based on T.F.L. and Timber Licences are detailed below. These figures do not provide a final basis for compensation, but are a reasonable estimate of the magnitude of expected losses.

A similar analysis has not been applied to the T.S.A. portion of Natural Zone in each option. Since the South Moresby Supply Block is not currently utilized as an operating area by any of the T.S.A. licensees, the implementation of the Natural Zone can not be tied to a reduction in cut from a specific tenure. In addition, the Supply Block makes a much smaller contribution to harvest relative to the T.F.L. or the Timber Licence area. It is therefore doubtful whether any resulting reductions would be compensatable. However, Section 53 clearly provides for a reduction in the allowable annual cut of forest licences and timber sale licences where Crown land in a T.S.A. is transferred out of timber production.

T.F.L. 24

The deletion and compensation provisions apply only to the Crown portion of the licence. In assessing a land withdrawal a distinction must be made between the contribution of purely Crown land and that of private land or old temporary tenures. The impact of a land use option is determined by estimating the contribution of withdrawn net operable land to the Crown portion of the presently approved A.A.C., applying consistent factors for utilization, losses and other constraints. The extent to which lands may be withdrawn without compensation is based on the percentage reduction from the allowable annual cut in effect at the beginning of the deletion period (a 25-year period which commences with the beginning of the term of the original T.F.L.). The permissible deletion without compensation is up to five percent of the Crown land portion of the A.A.C. which existed at the start of the deletion period. Where a land withdrawal results in a reduction greater than this five percent limit, the licensee must be compensated for the difference throughout the unexpired portion of the deletion period.

In the case of T.F.L. 24, the beginning of the current Management and Working Plan which supports the present A.A.C. is also the beginning of the deletion period for the licence. The Crown contribution of the current A.A.C. of 432 375 m^3 has been estimated to be between 410 000 and 415 000 m^3/year. A reasonable estimate of the compensation limit of five percent is 20 620 m^3/year. The contribution of withdrawn lands to the Crown A.A.C. portion are listed in Table 32. The rate of harvest contribution values in excess of 20 620 m^3/year are compensatable, and are also listed. Three of the four options involve compensation to the licensee. The additional and compensatable volumes resulting from either of the Windy Bay ecological reserve proposals are also listed in Table 32.

VALUE OF FOREST PRODUCTS

TABLE 32: Deleted and Compensatable Annual Volumes for T.F.L. 24 by South Moresby Land Use Option and Windy Bay Ecological Reserve Proposals

m^3/year

	Option 1	Option 2	Option 3	Option 4
Deleted Volume	3 950	76 125	109 323	150 341
- with Windy Bay E.R. Option A	28 457	98 412	131 609	172 628
- with Windy Bay E.R. Option B	6 844	79 427	112 625	153 644
Compensatable Volume		55 500	88 698	127 716
- with Windy Bay E.R. Option A	7 832	77 786	110 984	152 003
- with Windy Bay E.R. Option B		58 802	92 000	133 019

The above figures may also be expressed as a percentage of the total Crown A.A.C. contribution, as shown below.

TABLE 33: Percentage of Crown Contribution
to T.F.L. 24 A.A.C. Deleted and Compensatable
for South Moresby Land Use Options and
Windy Bay Ecological Reserve Proposals

m^3/year

	Option 1	Option 2	Option 3	Option 4
Deleted Percentage	1.0%	18.4%	26.5%	36.4%
with Windy Bay E.R. Option A	6.9%	23.8%	31.9%	41.8%
with Windy Bay E.R. Option B	1.7%	19.2%	27.3%	37.2%
Compensatable Portion		13.4%	21.5%	31.4%
with Windy Bay E.R. Option A	1.9%	18.8%	26.9%	36.8%
with Windy Bay E.R. Option B		14.2%	22.3%	32.2%

Timber Licences

Land withdrawals from a timber licence are evaluated in terms of area withdrawn. The extent of deletion may be expressed simply as a percentage of total area for a given licence. Compensation must be made for the portion of an area reduction which exceed five percent.

Timber Licences are affected only by Option 4. Three of the four licences would be entirely converted to Natural Zone, resulting in 100 percent area deletion. The total area deleted would be 680 ha. Ninety-five percent of the area of each licence would be compensatable. The total compensatable area from Option 4 is 646 ha.

Compensation Strategies

The overview study (ELUC Secretariat, 1979) encouraged the SMRPT in its terms of reference to anticipate "full application of Section 53 land withdrawals". The report noted that withdrawals in excess of the five percent legislated limit "must be compensated, ideally with suitable alternative sources of timber supply on the Queen Charlotte Islands".

The actual strategy for compensating the T.F.L. licensee has been difficult to address for several reasons. One of these is the vagueness of the FOREST ACT itself on this topic. Section 53 is intentionally general about the form of compensation, be it in cash, timber or otherwise. Furthermore, the criteria for establishing an appropriate level of compensation are not described at all. The one indirect reference to the subject is the Section 53(b) provision for ARBITRATION ACT proceedings in the event of a dispute. It therefore remains that appropriate compensation will be largely determined according to ministry policy. Such policy is by nature subject to the complex political considerations of the day.

An obvious policy criterion of compensation is that it incur minimal cost to the Crown. This criterion favours compensation in the form of timber rather than cash, but its application is contingent upon locating a timber 'trade' somewhere in the already heavily utilized provincial forests. In the case of T.F.L. 24, timber in close proximity to the licensee's operations would be an important feature. In the course of its investigation, the SMRPT debated the application of a compensation scenario involving the amendment of T.F.L. 24 to include Louise Island north of the study area. Louise Island is wholly within Block 6E of T.F.L. 39, held by MacMillan Bloedel Ltd. The Island currently is being harvested under contract.

Louise Island is adjacent to Western Forest Products' present logging operation at Sewell Inlet and would provide a logical extension to those operations. In addition, a cursory assessment of timber values suggests that the A.A.C. contribution of Louise Island and South Moresby are roughly equivalent. The fact that the cut contribution of Louise Island to the A.A.C. of T.F.L. 39 is less then five percent suggests an opportunity to compensate the T.F.L. 24 licensee at no cost to the Crown. However, the prospect of withdrawing land from one T.F.L. to compensate for withdrawing land from another raises an important question concerning the interpretation of Section 53. Since the circumstance is without precedent, a legal interpretation has not been provided by the courts. The planning team has generated two conflicting opinions regarding the applicability of this scenario.

i. The Ministry of Forests has advanced the opinion that, in principle, Section 53 does not allow the deletion from one forest tenure for the purposes of transfer to another. The provisions for land withdrawal to preserve wilderness stem from Subsection (1)(b) which allows the Minister of Forests to delete land to be used for purposes "other than timber production". The test would be based on the use of the land, and "compensation" is not a use of land but rather the premise upon which the land is allocated. The use of land is the purpose for which it will be managed, and its inclusion in a tree farm licence would be difficult to rationalize as a purpose "other than timber production".

ii. The team solicited a second opinion from the Public Interest Advocacy Center, which held that Section 53 can be interpreted more broadly than this. In this opinion, the ultimate "purpose" of the proposed withdrawal from T.F.L. 39 is in fact the creation of a park in South Moresby. This interpretation would appear to be further supported by Section 4 of the MINISTRY OF FORESTS ACT. Section 4(b) describes the purposes and functions of the Ministry as including the management of Crown forest resources for both economic and social benefits. Section 4(c) also requires the ministry to plan the use of provincial forests for wildlilfe, recreation and "other natural resource values" in a coordinated and integrated fashion. Although "social benefits" are not defined, this demonstrates a broad ministerial responsibility to the range of public demands on the forest resource.

Obviously the most desirable solution to the compensation issue is one which is negotiated to the satisfaction of all parties concerned. The possibility of a negotiated settlement with the holder of T.F.L. 39 should not be overlooked. Licensees are, in fact, free to negotiate alterations and amendments to the terms of their licences. In 1982 the Queen Charlotte T.S.A. was subject to a drastic A.A.C. reduction. The reduction reflected a reassessment of the land base and was unrelated to any land base alienation or compensation issue. However, the formidable allocation problems were solved by the relocation of cutting rights to other areas of the province. This exercise demonstrated that complex apportionment problems may be addressed. As the available timber supply on the B.C. coast is approaching full commitment, the solution to the South Moresby compensation needs will require an even greater degree of administrative flexibility.

5.5.4 SUMMARY

This section provides only a generalized summary of the timber resource impacts of each option. The summary does not address several complex issues which might have some bearing, either directly or indirectly, upon timber harvesting. This includes such questions as the timing of harvest reductions and the possibility of compensation in the form of alternative timber rights. The balance of Section 5.5 provides some discussion of these questions, as well as a detailed description of forest land base effects, rate of harvest implications, and economic impacts.

The following option descriptions do not examine harvesting operation impacts for the T.S.A. Harvesting in the T.S.A. portion of South Moresby is expected to emphasize small operations under all options except Option 4, with the latter precluding all T.S.A. harvesting in South Moresby.

The description of impacts in this summary does not include the effects associated with the Windy Bay Ecological Reserve proposals.

Option 1

Option 1 permits timber harvesting and forest management to occur on 22 percent of the South Moresby land base, or 99 percent of the net operable forest area. Three core areas at Hotsprings Island/De la Beche Inlet, Burnaby Narrows, and around Anthony Island would be unavailable for timber harvesting. Rate of harvest reductions for T.F.L. 24 are estimated to be 4 760 m^3 annually, or 1.1 percent of the T.F.L. A.A.C. Reductions for the T.S.A. are about 1 550 m^3 per year, or 0.6 percent of the T.S.A. total. The M.B. Timber Licences are not impacted by this option.

T.F.L. harvesting operations would be only minimally affected by this option.

Option 2

Option 2 provides for timber harvesting and forest management in the northeastern region of South Moresby on an area representing 15 percent of the total land base. Approximately 67 percent of the net operable forest area remains available to logging. The southern portion of Burnaby Island and all areas south of Skincuttle Inlet are removed from forest harvesting. For the T.F.L., rate of harvest reductions are estimated to be 18.6 percent of the T.F.L. harvest rate, or 80 420 m^3 of annual harvest. In the T.S.A., reductions would be 0.8 percent of the total, or 2 120 m^3 per year. The M.B. Timber Licences are not affected by this option.

The nature of any future harvesting operations on Burnaby Island would be altered significantly by this option. The Island could not in any event support a move of either the Sewell or Lyell camp to Burnaby, as was originally intended. The operations would be further constrained by the requisite use of a log dumping site at Section Cove, as opposed to the more desirable Poole Inlet location. Proposed boundaries on Burnaby may also leave some Resource Development zone physically or economically inaccessible. The overall reduction in T.F.L. rate of harvest associated with Option 2 would ultimately require a reduction in the size of one or both of the two major logging operations currently active within the T.F.L.

Option 3

Option 3 provides for continued logging over all of Lyell Island (excluding any provision for ecological reserve in Windy Bay), on the smaller islands north of Lyell, and the adjacent portion of the T.S.A. Timber harvesting and forest management would occur on 12 percent of the total South Moresby land base. Approximately 50 percent of the operable forest area in South Moresby would be available for harvest. Rate of harvest reductions in the T.F.L. are estimated to be 117 610 m^3 per year, or 27.2 percent of the T.F.L. total. The T.S.A. reduction would be about 6 760 m^3 annually, or about 2.6 percent of the T.S.A. A.A.C.

The ultimate T.F.L. rate of harvest reduction would require a substantial adjustment to the logging activity in the licence area. Should only one camp be reorganized to absorb the entire impact, the scale of that operation would near the limits of economic feasibility. Even if the reductions were spread across two operations, the economies of scale associated with those operations would be significantly impacted.

Option 4

Under Option 4, timber harvesting and forest management is confined to northern and central Lyell Island on seven percent of the total land base. Approximately 28 percent of the net operable forest land in South Moresby remains available for forestry activity. Rate of harvest impacts are estimated to be about a 37 percent reduction in the annual harvest level or about 159 980 m^3. Impacts in the T.S.A. are a reduction of 11 200 m^3 annually, or a 4.5 percent of the T.S.A. total.

Option 4 would lead to dramatic changes to timber harvesting operations in the T.F.L. Lyell Island operations would have to be phased out within a few years. Following the shut down on Lyell, all major logging activity in the T.F.L. would be concentrated for several decades in the Sewell Inlet/Tasu Harbour area.

5.6 Mineral Resources Evaluation

This section evaluates the actual and potential impacts of the options on the mineral resource sector. The evaluation focuses on specific criteria within the following areas:

i. Known mineral deposits
ii. Valid mineral claims
iii. Future opportunities for exploration and development
iv. Economic analysis

The primary impact on mineral values is the restriction of mineral exploration and development within the Natural Zone designation. When evaluating this impact, however, it is important to distinguish between mineral values encompassed by Natural Zone that are also within valid mineral claims and those values encompassed by Natural Zone that are outside of valid mineral claims. The Team recommends (see Section 4.1.1) that exploration and development be allowed to continue on valid claims in Natural Zones; however, if they lapse, there would be no provision to re-issue title, and all deposits or occurrences formerly within the claims then become inaccessible.

Most exploration effort on valid claims within South Moresby is, at the present time, directed primarily at gold. In general, claims containing iron or copper mineralization are not under active exploration at this time due to depressed metal prices. Mineral claims over these deposits, including those in Natural Zone, may therefore lapse regardless of their future potential. As a result, the impact of Natural Zone designation on mineral values is variable and difficult to assess at any point in time. Impacts in the following section are therefore shown as a range of known possible impacts.

i. Known Mineral Deposits

The 62 metallic mineral deposits and occurrences known in the planning area are divided into three categories (A, B, C) according to the level of exploration and development carried out, as discussed in Section 3.6.

The impact of each option on the three categories is summarized in Table 34. This table lists the number and percentage of each deposit category encompassed by the Natural Zone in each of the four land use options. Values are expressed as ranging from deposits in the Natural Zone not protected by existing mineral claims to all deposits in the Natural Zone regardless of claim status. This table can be interpreted as representing the range of possibilities from a scenario where all mineral claim holders maintain their claims in perpetuity to a scenario where all claims are allowed to lapse.

TABLE 34: Deposits Removed from Exploration and Development for South Moresby Land Use Options

Deposit Category	Option 1	Option 2	Option 3	Option 4
Developed A(25)	0 (0%)	6-17 (24%-68%)	8-20 (32%-80%)	9-25 (36%-100%)
Partially Developed B(11)	0-2 (0%-18%)	0-6 (0%-55%)	0-6 (0%-55%)	0-11 (0%-100%)
Undeveloped C(26)	0-1 (0%-4%)	14-23 (54%-88%)	15-25 (58%-96%)	15-25 (58%-100%)
Total (62)	0-3 (0%-5%)	20-46 (32%-74%)	23-51 (37%-82%)	24-62 (39%-100%)

ii. Valid Mineral Claims

Mineral claims cover 35,491 hectares, 24.4 percent of the planning area land base. 12,327 hectares are currently reserved from staking (De La Beche and Ecological Reserves). Mineral claims therefore cover 26.7 percent of the land base available for mineral exploration.

The Natural Zone/Resource Development Zone boundaries for each option were transferred to Mineral Title Maps (scale 1:50 000) and the areas of claims within each zone was determined. The results are tabulated in Table 35.

TABLE 35: Distribution of Mineral-Claimed Areas by Land Use Zone for South Moresby Land Use Options

Mineral Claims		Option 1	Option 2	Option 3	Option 4
Within Natural Zone	hectares	4,281	11,168	13,341	27,664
	% of total	12.1%	31.5%	37.6%	77.9%
Within Resource Development Zone	hectares	31,210	24,323	22,150	7,847
	% of total	87.9%	68.5%	62.4%	22.1%

As indicated in the introduction to this section, existing rights to explore and develop these claims will be maintained; however, claims in Natural Zone will not be re-issued if and when they are allowed to lapse.

iii. Future Opportunities for Exploration and Development

Gold deposits and iron-copper deposits currently present the most favourable exploration and development targets (see Section 3.7). Surface access is necessary to areas with moderate to high potential if future benefits are to be realized. The impact on future opportunities can best be understood by measuring the area of land in each class of mineral potential that would fall within Natural Zone designation under each option. Natural Zone designation over Class 2 (high potential, geological environments with known deposits) consitutes a greater negative impact on mining and mineral exploration than Natural Zone designation over an equivalent area of Class 3 (moderage potential, favourable environments, no deposits known). Table 36 summarizes these impacts. Values are again expressed as ranging from deposits in Natural Zone not covered by existing mineral claims to all deposits in Natural Zone regardless of current claim status. This table can be interpretated as representing the range of possibilities for a scenario where all mineral claim holders maintain their claims in perpetuity to a scenario where all claims are allowed to lapse.

TABLE 36: Mineral Potential Areas within Natural Zone Designation of South Moresby Land Use Options

Mineral Potential	Option 1	Option 2	Option 3	Option 4
High Class 2 (ha)	1 500-2 700	8 300-11 700	9 500-12 900	12 700-13 000
(% of Class 2)	(11.5%-20.7%)	(63.6%-89.7%)	(72.8%-98.9%)	(97.3-99.6%)
Moderate Class 3 (ha)	15 400-15 900	34 800-37 900	38 000-42 800	54 900-62 000
(% of Class 3)	(24.8%-25.6%)	(56.0-61.0%)	(61.1%-68.9%)	(88.4%-99.8%)
Low Indeterminate Class 4 (ha)	31 500-31 600	57 500-57 800	66 200-66 900	69 800-70 000
(% of Class 4)	(44.9%-45.0%)	(82.0%-82.4%)	(94.4%-95.4%)	(99.5%-99.8%)

The total area removed from exploration and development for each option is shown in Table 37. This table shows the range of opportunity foregone from areas of Natural Zone not covered by current mineral claims (assumes claims will be held and opportunities maintained) to total area of Natural Zone (assumes claims lapsed and opportunities foregone).

TABLE 37: Total Area Removed from Future Exploration and Development for South Moresby Land Use Options

	Option 1	Option 2	Option 3	Option 4
Area of Natural Zone not covered by claims (% of South Moresby)	44,220 ha (30.5%)	89,330 ha (61.6%)	100,460 ha (69.3%)	109,310 ha (75.4%)
Total area of Natural Zone (% of South Moresby)	48,500 ha (33.4%)	100,590 ha (69.3%)	113,800 ha (78.5%)	136,970 ha (84.5%)

iv. Economic Analysis

The economic impact of each option on the mineral resource base is difficult to determine. The value of measured and inferred reserves of known deposits, and required exploration expenditures on currently valid claims, provide a baseline measure for economic impacts. The analysis cannot reliably predict any future exploration boom that would follow the discovery of a new deposit in the area.

The value of known reserves and inferred resources is listed in Table 14, Section 3.6. It should be noted that these deposits are not considered economically viable mining prospects at this time. The actual and percentage reduction of the total value for each option is listed in Table 38. This table again represents the range of impact based on presently known deposits and current mineral claim distribution. The values show the impact of Natural Zone designation ranging from all existing claims being maintained to all claims lapsing.

TABLE 38: Potential Value of Unknown Deposits Removed from Exploration and Development for South Moresby Land Use Options

	Option 1	Option 2	Option 3	Option 4
Potential value of known deposits removed from exploration & development	0	$6,275,000 to $164,200,000	$117,210,000 to $274,700,000	$121,400,000 to $278,990,000
	(0%)	(2.4%-59%)	(42%-98.5%)	(44%-100%)

The value of total mineral resource endowment for South Moresby is believed to be much greater; however, it is not possible to place a dollar value with any certainty on this endowment with the existing data base. The future economic viability of developing any of these deposits is also an unknown at this time. Therefore, the above table must be viewed only as an indication of potential value of known deposits and not as a value of total deposits nor as a value of viable mineral operations foregone. Few of these known deposits have an current economic value. They are primarily iron and copper ore reserves that cannot be extracted profitably at present metal prices. They may, however, have future economic value.

Based on mineral claim assessment work requirements outlined in Section 3.4.3, mineral claims covering 35,491 hectares of South Moresby require $283,928 exploration expenditure and $14,147 recording fees per year to remain valid. The impact of Natural Zone designation on these values is difficult to assess. Natural Zone designation may result in claims being allowed to lapse with corresponding economic opportunity foregone. Alternatively claims may lapse if exploration proves they contain no mineralization.

Summary

Option 1

This option has little impact on known mineral values covered by valid claims but a significant impact on areas of lower or indeterminate mineral potential.

None of the known deposits or occurrences would be immediately affected. If existing claims lapsed up to five percent of the known deposits would be removed from exploration and development opportunities.

12.1 percent of existing mineral claims would be incorporated in the Natural Zone; 11.5 percent to 20.7 percent of the high mineral potential, 24.8 to 25.6 percent of the moderate mineral potential, and 44.9 percent to 45.0 percent of the low or indeterminate mineral potential would be removed from exploration and development opportunity.

In total 30.5 percent to 33.4 percent (depending on the future of existing mineral claims) of the land base of South Moresby would be removed from future exploration and development opportunity. Therefore, this option does not represent a full resource development option from the perspective of the mineral industry, and hence the Ministry of Energy, Mines and Petroleum Resources has presented an alternative approach to mining in Section 4.3.

Option 2

Option 2 would result in major impacts on all sectors of the mineral resource base.

Thirty-two percent of known deposits and occurrences would be immediately withdrawn from development potential, representing a 2.4 percent reduction in potential value of measured deposits. Fifty-five percent of recently discovered gold deposits would be incorporated in the Natural Zone. If claims lapsed up to 59 percent of the potential value of measured deposits would be removed from development opportunity.

31.5 percent of existing mineral claims would be incorporated in Natural Zone; 63.6 percent to 89.7 percent of the high mineral potential land, 56.0 percent to 61.0 percent of the moderate potential land, and 82.0 percent to 82.4 percent of the low or indeterminate land would be removed from exploration and development opportunity.

In total 61.6 percent to 69.3 percent (depending on the future of existing mineral claims) of the land base of South Moresby would be removed from future exploration and development opportunity.

Option 3

Option 3 represents a geographic separation of resource users in South Moresby. This would create a significant alteration of the known mineral resource base.

Thirty-seven percent of known deposits and occurrences would be immediately withdrawn from potential development, representing a 42 percent reduction in potential value of measured deposits. If existing claims lapsed up to 98.5 percent of the potential value of measured deposits would be removed from development opportunities.

37.6 percent of the existing mineral claims would be incorporated in Natural Zone; 72.8 percent to 98.9 percent of the high mineral potential land, 61.1 percent to 68.9 percent of the moderate potential land, and 94.4 to 95.4 percent of the low or indeterminate land would be removed from exploration and development opportunities.

In total 69.3 percent to 78.5 percent (depending on future of existing mineral claims) of the land base of South Moresby would be removed from exploration and development opportunity.

Option 4

Option 4 represents a more significant reduction of extractive resource uses in South Moresby.

Thirty-nine percent of known deposits and occurrences would be immediately withdrawn from potential development, representing a 44 percent reduction in potential value of measured deposits. If existing claims lapsed up to 100 percent of the potential value of measured deposits would be removed from development opportunity.

77.9 percent of existing mineral claims would be designated as Natural Zone; 97.3 to 99.6 percent of the high mineral potential land, 98.4 percent to 99.8 percent of the moderate mineral potential land, and 99.5 percent to 99.8 percent of the low or indeterminate mineral potential land would be removed from exploration and development opportunity.

In total 75.4 percent to 94.5 percent (depending on the future of existing mineral claims) of the land base of South Moresby would be removed from future exploration and development opportunities.

5.7 Evaluation of the Alternative Approach to Mineral Resources

This section indicates in general terms the impacts of the alternative approach to mineral resources, as presented in Section 4.3, on the various resource values in the study area. The evaluation covers impacts on the natural environment, cultural heritage, wilderness recreation, and fisheries values, and on the mineral resources themselves. Timber resource values are not affected as the alternative approach to minerals deals only with the Natural Zone.

5.7.1 NATURAL ENVIRONMENT, CULTURAL HERITAGE, WILDERNESS RECREATION, AND FISHERIES VALUES

The primary effect of the alternative approach to mineral resources on all these resource values is that all Natural Zone areas are open to possible impacts from mineral exploration and development activities. Disturbance and degradation of ecosystems, wildlife and fishery habitats, cultural features and recreational values can all be expected where mineral development activity occurs.

Exactly where, when, and to what degree impacts may occur is not possible to determine due to the difficulty of predicting what kind of mineral deposit will be found in the area. Similarly, it is not possible to evaluate the degree to which impacts could be mitigated until the mineral deposit is located and development alternatives are evaluated, for example underground versus open pit mining. The only assessment of the alternative approach to mineral values is to say that the natural and cultural resource values face an uncertain future. However, disturbance would probably be limited to small areas.

This situation particularly affects the wilderness and recreation values which are otherwise protected and managed for in the Natural Zone but are not provided with security through this alternative mineral approach. Mineral exploration and development activities have the potential to very seriously degrade wilderness and recreation values, and areas managed to provide opportunities for public and commercial recreational activity could have their intrinsic value for those uses diminished or negated at some point in the future.

5.7.2 MINERAL RESOURCES

The mineral resource sector would not be significantly affected if the approach described in Section 4.3 were adopted in conjunction with any of the Options 1 to 4. Discovered mineral resources, plus undiscovered prospects, would remain accessible to exploration and development.

The designation of 12 000 hectares (8.3 percent of South Moresby) as temporary mineral reserves over core recreation areas for a minimum of five years would have no impact on existing claims. The full impacts of permanently withdrawing these lands from exploration would be ascertained once field surveys conducted by the Ministry of Energy, Mines and Petroleum Resources had determined their mineral potential.

The impact on the mineral sector of progressive establishment of mineral reserves in the Natural Zone is presently uncertain. The total negative impact on the mineral sector would be kept to a minimum by restricting mineral reserves to those areas with demonstrated low mineral potential and high natural recreation values.

Adopting this approach will require an increase in administrative costs and increase the mineral industry's cost of exploration and rehabilitation of disturbed lands. The increased administrative cost would be minimal when compared to the benefits that could be realized from a producing mine.

This approach provides two major opportunities to the mineral sector:

i. It distinguishes between the forest and mineral sector and recognizes the different inventory knowledge of these two resource industries.

ii. It permits an evaluation of mineral resources before decisions to either permit or prohibit development are made.

6.0 PUBLIC RESPONSE

The South Moresby land use issues generated considerable public response during the period of the planning team's work. Most of this response is documented in the form of letters written to the Premier of British Columbia, the Minister of Environment, and the Minister of Forests, expressing various views and preferences for land use. Many letters have been written by people from all over North America who have had an opportunity to travel through South Moresby. The letters are to some extent a reflection of the publicitiy which the issues received via the media, as well as attempts by special interest groups to inform the public and promote support for a given position. Local response from the Queen Charlotte Islands is largely attributable to a series of public information meetings held by the team in the fall of 1982, and continuing releases from the Chairman to the local press regarding team proceedings. A great deal of the correspondence has been initiated by the controversies surrounding Windy Bay and Dodge Point. A large percentage of letters outside of British Columbia, in particular, refer to Dr. Suzuki's 1981 production on Windy Bay which was aired as part of "The Nature of Things" television show.

A total of 591 letters have been documented on file for the period ending August 1, 1983. Seventy-three percent of the letters originated from B.C., as summarized in Table 39 below. The letters are divided into two categories, which may be interpreted as follows.

Preservation:	letters which express preference for wilderness preservation of South Moresby and/or Windy Bay.
Development:	letters which express preference for a multiple use or resource development strategy for South Moresby and/or Windy Bay.

TABLE 39: Summary of Public Letters from B.C. Residents to the Provincial Government

	Preservation	Development	Total
Lower Mainland	152	9	262
Vancouver Island	111	15	126
Queen Charlotte Islands	30	39	69
Remainder of B.C.	72	1	73
Total	365	63	429
%	85%	15%	100%

The remaining letters originating outside of B.C. all expressed support for wilderness peservation. These letters are listed according to geographical source in Table 40. In summary, 89% of all letters received were written in favour of wilderness preservation.

TABLE 40: Summary of Public Letters from Outside B.C. Expressing Support for Wilderness Preservation

Canada		United States		Other	
Alberta	26	Michigan	1	Australia	1
Saskatchewan	14	California	4		
Manitoba	7	Washington	3		
Ontario	76	Ohio	1		
Quebec	11	Oregon	2		
New Brunswick	4	Maryland	2		
Nova Scotia	3	New Jersey	2		
Newfoundland	2	Wisconsin	1		
		Georgia	1		
		Connecticut	1		
		New York	1		
		Texas	1		
Total	143		20		1

7.0 MATTERS REQUIRING FURTHER CONSIDERATION

7.1 Further Planning Needs

The preparation and submission of this report does not represent the final step in resource planning in South Moresby. Indeed, an area as complex and potentially sensitive as South Moresby must be the subject of continual planning efforts at more detailed levels. This was recognized in the 1979 ELUC Secretariat Overview Study, which specifically identified a need for the development of environmental management prescriptions for the area. It is the feeling of the planning team, however, that detailed environmental management prescriptions can be effectively developed only after the general land use directions for the area have been established.

In the absence of an overall land use plan, it is not currently feasible for the planning team to recommend precise terms of reference for future planning tasks. It is possible, however, to identify those subject areas which may be important in future planning:

- The precise definition of administrative boundaries.
- The implementation of revised rates of timber harvest, with adjustments to the location of harvest, as required to meet the selected overall land use direction in the area.
- Guidelines for mineral exploration and development in the Natural Zone and for sensitive areas within the Resource Development Zone.
- Recreation management objectives and guidelines for areas within the Natural Zones.
- Objectives and guidelines for forest landscape management and recreation management in Resource Development Zones.
- Guidelines for scientific and educational use in Natural Zones.
- Guidelines for scientific, educational, and recreational use in ecological reserves.

- Fish and wildlife management guidelines, including the protection of unique wildlife features.
- The development of a marine component management strategy (this appears to require senior level contact between provincial and federal authorities as outlined in Section 7.2).
- Guidelines for the management and protection of heritage resources (some specific recommendations regarding the management and protection of heritage sites are provided in Section 7.3)
- Guidelines for forest protection in Natural Zones.
- Foreshore management guidelines in Resource Development Zones.

Detailed planning in South Moresby should be preceeded by a review of roles and responsibilities for planning and public involvement. The South Moresby Resource Planning Team may have a further role in some aspects of future detailed planning. Forums for continued public input and inter-agency cooperation should be implemented. If major administrative shifts arise from the selected overall land use plan, the current lead support role of the Ministry of Forests may no longer be applicable, and the reporting structure for the planning team or any similar body should be amended accordingly.

7.2 Further Action Regarding the Marine Environment

As described in Section 4.1.3, the team has been unable to fully address the question of an appropriate management strategy for the marine environment in South Moresby. The planning team in general has recognized the need to investigate possible management strategies for the marine environment. In particular, it has been generally recommended that those marine areas adjacent to upland Natural Zones should be managed so as to achieve at least some measure of compatibility with the Natural Zone management strategy.

Due to the fact that several key aspects of marine management fall under federal jurisdiction; it is evident that federal authorities must be actively involved in the development of management strategies for the marine environment. Therefore, it is recommended that immediately following the final decision regarding management of the South Moresby upland the province initiate discussions with appropriate authorities within the Government of Canada with the objective of formulating a suitable management strategy for the marine environment in South Moresby.

7.3 Management and Protection of Heritage Sites

The planning team in general has recognized the significance of heritage sites, and that measures for the management and protection of this resource require some further definition. Some specific recommendations are as follows:

a) Archaeological research including excavation is considered to be compatible with all land use zonations.

b) As a matter of policy, the Q.C.I. Museum should be meaningfully involved by government in the inter-agency referral process, in ongoing inventory, and in other heritage programs.

c) Financial responsibility for the funding of site inventories, for the on-site inspection of development plans, and for heritage conservation in general should be clarified.

d) Policy regarding the degree of protection to be afforded to Haida forest use sites should be clarified.

e) Sites should be given an adequate buffer zone to protect them from the indirect effects of development such as slides.

f) Lands within all use zones, both wilderness and developmental, should be further zoned according to heritage site potential.

g) Development within zones of high heritage site potential should be subject to on-site inspection by a qualified archaeologist while development is still in the planning stages.

h) Certain types of landforms, such as cliff-overhangs, rockshelters, and caves should be considered to be "heritage landforms" because of their high probability of containing heritage remains.

i) Such "heritage landforms" should be excluded from any form of development.

j) Such "heritage landforms" should be excluded from any form of promotional activity and kept at a low profile with respect to tourism, with visitation discouraged.

k) The extraction of fossils for commercial purposes should be prohibited.

l) The casual collecting of fossils should be excluded from any form of promotional activity and should be discouraged.

m) The Heritage Conservation Branch should be encouraged to clarify policy regarding localized natural scenic sites.

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APPENDIX

South Moresby Resource Planning Team

MEMBER STATEMENTS

The following statements were submitted by individual members represented on the planning team. Statements have not been submitted by representatives from provincial government agencies.

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Department of Fisheries and Oceans

General

It is the position of the Department that commercial and recreational fisheries can and will continue in the marine areas adjacent to South Moresby. The current or realized sustainable level of harvest from the marine component of South Moresby must not be altered. In addition, native food-gathering from the marine component must not be displaced as a result of this planning process.

The Department acknowledges the importance of coordinating commercial and recreational fishing activities with the wilderness objectives of South Moresby. The conduct of nearshore activities within the marine component will be determined to some extent by the management strategies prescribed for the adjacent upland. Nearshore commercial operations may be arranged so as to avoid any serious conflict with visitor use of the area. This would be accomplished by either dispersing operable commercial harvesting areas and/or the scheduling of commercial activities, and special care taken during the conduct of commercial fisheries. This special care would include, among other things: restrictions on garbage disposal and onshore activities, and tree cutting/brush clearing for boundary sign placement.

The nearshore marine component would be partitioned into commercial and recreational zones (with regard to a fishery order-of-importance emphasis only). The number, size and location of these zones would be partially governed by the configuration of the upland designations approved by the Provincial Government. The establishment of marine parks may occur following field investigations and negotiations by Parks Canada.

Marine areas of high visitor use, such as anchorages and popular recreational sites, will for considered by a recreational zone designation. Recreation zones may include embayed water bodies and defined sections of coastline. Generally, these zones will not be established in regions of high commercial values. Recommendations for additions or deletions to the recreational zones would be considered annually by D.F.O. under advisement with the recreation management authority.

In general, no commercial harvesting of any marine species would occur within a recreational zone during the regulated period of closure: that is, normally January 1st to December 31st. Due to unpredictable herring distribution, these closures will not affect herring-related fisheries. The dynamic nature of the fishery resource requires an overall flexible management strategy to meet ever-changing conditions. It is intended that commercial openings may occur in recreational zones. However, such openings would be substantiated by inventory information and follow notification of the recreation management authority responsible for the adjacent upland. This strategy is viewed as a working arrangement between D.F.O. and the recreation management authority.

Position Statement

Forestry, mining and other forms of resource extraction would continue in the development zone of South Moresby under current environmental guidelines and constraints. Current fish habitat protection guidelines are designed to minimize the risk of deleterious effects due to the activities of such industrial operations. However, these guidelines cannot eliminate the risk of damage to fish habitat which may be caused by long-term chronic factors (such as increased sedimentation of riverbed gravels) or sudden events which may be induced by industrial activities (e.g., mass-wasting).

The Department views the designation regarding resource development or natural zones in Options 1 to 4 as being a land use consideration. In this regard, consideration has been primarily concerned with the relative merit of each option as it affects the freshwater habitat of anadromous salmonids. Management of the marine component is viewed as a separate issue from that of land use considerations, and therefore does not enter into option selection.

The ELUC terms of reference were given foremost consideration when this Department developed its position regarding selection of options. It was evident that the ELUC recognized the need for some alienation of terrestrial resources from harvesting in the interests of wilderness preservation. However, certain areas of South Moresby should remain in development to the extent that a viable industry is maintained in the geographic areas adjacent to the wilderness. The main purpose of the planning team was to recommend boundaries between these single-use interests of industry and wilderness that would ensure the long-term continuation of both.

Given this understanding, it is the opinion of the Department of Fisheries and Oceans that Options 2 and 3 satisfy the ELUC terms of reference. The primary difference between these two options is viewed as the shift in overall industrial potential. However, as a result of the option evaluation previously presented by D.F.O., Option 3 offers a significantly greater degree of protection for freshwater fish habitat. Accordingly, this Department recommends Option 3 as the basis for future land planning in South Moresby.

ISLANDS PROTECTION SOCIETY

General

The participation of the Islands Protection Society (IPS) in the South Moresby Report is based upon our role as initiator of the South Moresby Wilderness Proposal in 1974. Today, our role is the same, yet the scope of public attention and involvement has grown substantially. Nine years ago, we were 500 Queen Charlotte Islands residents trying to protect an area from the destructive consequences of clearcut logging witnessed on these islands. Today, some 50,000 people have signed petitions, written letters and otherwise invested in the proposal to allocate South Moresby to non-consumptive uses which enhance its natural heritage values.

The Planning Process

Our Society has contributed to the South Moresby Report with mixed feelings. Our primary frustration has been that the original Wilderness Proposal was never allowed for in the terms of reference adopted by the Ministry of Forests. Consequently, timber harvesting has been permitted extensively on Lyell Island for the past nine years. This has created a variety of impacts on wilderness values in the northern third of the area (ref. Section 5.3).

In effect, the total conservation option for South Moresby has been sacrificed, primarily to the 1979 renewal of T.F.L. 24. It is unfortunate that this decision was made in a climate of haste and legal controversy, and did not have effective exposure to wider public input. It is likewise unfortunate that the Ministry of Energy, Mines and Petroleum Resources has recently permitted widespread staking of exploratory mineral claims in South Moresby. For these reasons, IPS does not in principle endorse any of the four options recommended in this Report. Our position remains that the degree of protection suitable to South Moresby's special values (Section 3.3.1) requires the preclusion of timber and mineral extraction industries.

As one of B.C.'s more prominent land use issues, South Moresby has provided an extensive experiment in "public involvement". The IPS has participated in the Planning Team, in spite of the just-mentioned shortcomings, because it was the process which was offered. In that a dozen widely disparate member viewpoints came to the understandings embodied in this Report, it has been a valuable process. We recommend its use in similar circumstances. To what extent decision-makers will weigh the thrust of this public input against the "bottom-line" arguments of the forest industry remains to be seen. The most valuable aspect of the planning process, however, has been the opportunity it has provided for the public to become aware of South Moresby's special features and the issues affecting them. As mentioned earlier, this has permitted some 50,000 people to express their opinions, overwhelmingly in favour of the natural heritage uses described below.

Multiple Use

Throughout the past nine years, while the prospects of logging and mining industries have suffered a variety of setbacks, several new industries have grown substantially in South Moresby. The most obvious of these is tourism, which has exceeded even provincial growth trends (Section 3.3.2, 3.3.4).

Another industry to benefit in direct relationship to tourism is the information media. As various newspaper and magazine articles, radio and television productions report the details of the South Moresby issue, the public demand for a wilderness tour-guiding industry has grown. This industry in turn has allowed growing numbers of photographers and journalists to visit the area and report their experiences to an ever-widening audience. South Moresby has thus become a tourist destination of increasing stature.

Tourism has added a welcome diversification to the local economic base. It is the only industry to offer a prospect of continued future growth and increased local employment opportunities. This should be considered a worthwhile alternative to the economics of clearcut logging, whereby the land base is rendered incapable of producing direct revenues for 80 years or more. A truly sustainable multiple use of South Moresby resources would not only conserve its special values as a natural heritage, but would also continuously sustain a range of rewarding industries. Considered along with various scientific, educational, fisheries and cultural industries presently benefitting from the South Moresby heritage, it can be seen that conservation constitutes a viable social and economic alternative use of the area's unique resources.

Compensation

The major obstacle to the creation of a park in South Moresby is without doubt the existence of Tree Farm Licence 24. Section 53 of the FOREST ACT requires compensation of the licensee for withdrawals from a T.F.L. in excess of five percent. It therefore becomes vital to formulate a satisfactory compensation agreement. The example advanced in Section 5.6.3 of this Report is provided to illustrate that perhaps the compensation problem is not the costly enigma it first seemed to be. A careful and wide-ranging study by the Ministry of Forests of the potential solutions would therefore be a useful exercise. Our Society particularly recommends that cash costs to the Crown be minimized. This would best be accomplished through consultation with various licensees about either reallocation of timber rights elsewhere in the Province or other arrangements acceptable to the corporations involved.

Conclusions

Nine years ago, the South Moresby issue was a warning flag raised by several hundred Queen Charlotte Islanders. They sought to bring to the world's attention a natural heritage of rare beauty, untold complexity and bounty. They warned of the area's impending loss to a timber industry in crisis.

Today, South Moresby is an issue of national and global significance. Our Society urges the decision-maker to recognize the social, economic and environmental wisdom of changing our industrial priorities in South Moresby. With understanding and creative administration, South Moresby can exceed the income-earning potential of today's extraction industries. It is a decision which requires the foresight to see beyond the short-term clamour of daily economics. It can only be made by a government dedicated to long-range planning and responsive to broad social requirements. In the end, the creation of a South Moresby natural heritage park would be to the everlasting credit of the decision-maker.

Public Representative

From the outset my concern as Public Representative on the Planning Team has been to seek a compromise solution for South Moresby which would satisfy the public from the viewpoints of aesthetics, practicality and fairness.

I believe that Option 3 meets all these requirements.

From the viewpoint of aesthetics, the separation of a wilderness/recreation area from resource extraction activities will allow for the preservation of those wildlife and scenic qualities which now make South Moresby so attractive.

In the practical sense, the relatively large size of Option 3 will allow for dispersal of a fairly large number of visitors without overcrowding and jeopardizing the sense of isolation they will seek. It will also allow sufficient room for maintenance of a wide variety of species and their habitat. Option 2, being considerably smaller, would be impractical for these purposes. Additionally, it would not protect the key recreational area of Juan Perez Sound and would seriously compromise the Burnaby Narrows area.

I have no difficulty at all with the question of fairness. Option 3 comes closest of all to a 50/50 split in timber values. It contains 55 percent of the mature timber volumes and 39 percent of the A.A.C. attributable to the South Moresby contribution to T.F.L. 24. The public would gain more from protected land, water and shoreline. The public is not unaware that it is public land and public timber that is being dealt with.

I believe that selection of Option 3 will find majority support within the general population.

The forest and mining industries have maintained throughout the planning process that South Moresby is not unique among coastal environments. They also feel that resource extraction is consistent with wilderness/recreation values, and to support that point out that South Moresby has seen resource development in the past.

I would like to deal with these issues using arguments not found in the Report.

Within Option 3, South Moresby has not experienced sustained and widespread resource development and habitation. There have been localized exceptions: a whaling station operated at Rose Harbour in the late 1800's; the Ikeda Mine operated underground at Ikeda Cove for about 15 years, closing in the 1920's; from the period 1937-44, 901 hectares of A-frame logging occurred in Juan Perez Sound; in the 1960's, Jedway, an open-pit iron ore mine, operated in Skincuttle Inlet for about six years.

Thus, within Option 3, industrial activity has been highly isolated in both place and time over the past 100 years. It is for this reason that the area has remained pretty much as the European found it. It still contains, as best as we can tell, its original environment and abundance of wildlife. As is well documented in the Report, such abundance and variety is to be found nowhere else on Canada's West Coast.

Should logging become a permanent presence within South Moresby, bringing with it clearcutting, commercial traffic and habitation, it is very likely that the area will become similar to that found anywhere else on the Coast.

It should be obvious that if South Moresby is left as we now find it, and as other areas become more developed and accessible, South Moresby will become as outstanding within its surroundings as Stanley Park is to Vancouver. This is confirmed by what we see before us today in every developed part of the world.

The logging industry maintains that clearcuts will be visible only a short time, until green-up takes place, and that timber not harvested now will be revenue left rotting on the ground.

Aside from the implications that logging presents to a balanced ecosystem, visitors have not come to South Moresby to see a logged-off area identical to that found anywhere on the Coast. Today the foreign visitor (and South Moresby receives many) marvels at the old-growth forest, and he well knows the difference between it and the plantation which he can see at home. In a very short time such will also be the experience for the British Columbian.

The forests of South Moresby are not, as the forest industry would have us believe, so decadent that if not harvested soon, they will come crashing to the ground. Those forests have stood for millennia, and they contain not only the hoary old giants of 500 years or more but also the new trees ready to take their place. Among this new growth are trees still vigorous and young at 200 or 300 years of age. We cannot assume that our generation has somehow appeared at the culmination of a cycle tens of thousands of years old.

What the forest industry proposes for South Moresby is to end the normal forest cycle and institute instead an economically-derived rotation of 70 years, applied to every harvestable acre. No tree, except those deemed inaccessible or of too poor a quality, would live beyond 70 years under the industrial option. The industry also plans its normal regime of herbicides and pesticides for the growing forest.

It is being said today that economics, the need for jobs, should override the call for preservation. However, at the present time the shortage is not one of timber, but of markets. Wood not produced from South Moresby can be readily supplied from other Coastal operations. These, including some on the Charlottes, are shut down because of the market situation. Should Option 3 be left untouched, there would at the present time be no loss of jobs or revenue to the Province.

Assuming a market improvement, the money that would be spent in harvesting South Moresby's forests can be spent more productively in upgrading or building new Coastal sawmills. It is well known that B.C.'s Coastal mills depend upon volume of production and not upon quality to be profitable. They are in effect losing both jobs and revenue to the Province as they butcher the last of our old-growth wood.

If left, the forests of South Moresby will retain their present marketability, as they always have. More likely, their value will increase as the old-growth is removed everywhere else. Should the need for them become great, as in times of war, these forests will remain for the use of future generations. Those who fear South Moresby's forests will become "locked up" exemplify a type of greed which recognizes no value other than immediate gain.

Much the same may be said of mining in South Moresby. The ore has been there since time immemorial and no doubt can remain without harm for a similar length of time. It makes sense to have an inventory of such mineralizations, as is done in the U.S. park system, to await development in a time when mining technology has improved and environmental knowledge will have increased. Given today's well-documented environmental failures within the industry, and its present negative public stance toward environmental procedures, I do not believe that the industry is mature enough for an area as important as South Moresby. Certainly nothing that was presented to the Team gave indication of substantive change from present policy.

Notwithstanding the above, both the forest and mining industries serve vital and necessary functions in our resource-based Province. Both industries feel that they operate not only for their own interests, but in the best interests of the Province as well. As a generality, I support them in those statements. However, it is unfortunate that they are isolated from the rest of British Columbians by attitudes which do not include the necessity for preservation of irreplaceable heritages such as South Moresby.

The Minister of Forests and the Government of British Columbia are to be congratulated for their faith in and enhancement of the democratic process which was demonstrated by inviting the public to particulate in the decision-making process. The Regional Manager and his staff are owed a debt by the people of this Province for the considerable resources and tremendous energy they have diverted to the Team in their effort to make it a success.

Queen Charlotte Islands Museum Society

Early in the planning process, the Director/Curator of the Museum was invited to join the Team because of his background in archaeology. He was asked to provide information on heritage sites in the study area and their conservation, and to represent the interests of the Queen Charlotte Islands (Q.C.I.) Museum and of the professional heitage sites community at large. Recommendations made in the furtherance of these interests are detailed in Section 7.3 of this Report, and are forwarded as recommendations of the Planning Team.

The interests of the Q.C.I. Museum are best summarized by the following statement of its objects, as quoted from its constitution:

> "to acquire, conserve and preserve, study, research, interpret, assemble and exhibit artistic, scientific, historical and technological objects of educational and cultural value."

Clearly, the Society has an interest in heritage sites, and an interest in closer involvement in planning and other activities related to them. The Museum has been internationally recognized and has kept its standards up to international quality. It has received the prestigeous Heritage Canada award for the conservation of Canada's heritage. The Society, whose officers and trustees are drawn from each of the Islands communities, has broad support for the expansion and development of heritage activities. Through its programs, Haidas and non-Haidas have been ivolved in training, research, conservation and display. The distinctiveness of the Queen Charlotte Islands is reflected in its Museum; it is a rich heritage which is internationally acclaimed.

Notwithstanding the generality of the foregoing considerations, the Society agreed at the outset of planning that it would not formulate a preference for one option over another. In its view, this would allow each member to exercise his conscience individually, and to become only as involved as he wished.

The interests of the professional heritage sites community were determined through informal discussions and a questionnaire on South Moresby, as well as personal membership in the profession for nearly two decades. Professionals queried on this plan have all been senior with positions in the Heritage Conservation Branch, the Provincial Museum, universities, colleges and in private business. The Heritage Conservation Branch had not had time to study the plan and declined to express an opinion. A questionnaire was circulated on May 11, 1983 to 16 senior archaeologists and related professionals in the province, most of whom had visited the study area. Eight pages of background material accompanied the questionnaire, including an economic summary of the impacts of the four options on forestry, an economic summary of recreation and a summary of archaeological concerns, all drawn from the then current draft of this Report. Thus the recipients were well informed of the issues. Eight persons responded, representing a cross-section of the profession. No responses were received from the Heritage Conservation Branch. One person had not been to the area; the rest had spent from seven to 200 days, averaging 40, for a total of 322. When asked whether, despite the best efforts of the Heritage Conservation Branch, they thought that the present referral process was inadequate to protect sites from destruction due to development, five strongly agreed, two agreed and one was neutral. When asked whether forest development was a major threat to heritage sites, seven strongly agreed and one agreed. When asked about mining development being a major threat to heritage sites, one strongly agreed, five agreed and two disagreed. When asked similarly about tourism being a major threat, two strongly agreed, one agreed, one was neutral, three disagreed and one strongly disagreed. Thus as a group there was strong agreement that forestry was a major threat to heritage sites, there was some agreement that mining was a threat, and there were mixed feelings about tourism.

The respondents as a group favoured the adoption of Option 4. Six favoured Option 4, one favoured Option 2, and one was undecided between Options 2 and 3. They strongly agreed with Option 4 and strongly disagreed with Option 1. Feelings towards Options 2 and 3 were largely neutral.

Within the profession, a picture emerges: Among the developments likely in South Moresby, forestry stands out clearly as being the major threat to heritage sites. Largely because of this, the maximum park option (Option 4) is strongly favoured. Professionals view heritage sites as an outdoor treasury of historic information. As such heritage sites are a unique research library and archive which holds answers to the qustions of our origins and our purpose. It is also clear that a large portion of the public seeks answers to those same questions. They travel as tourists, seeking out their cultural and natural heritage. Of the tourists who visit the Islands, 85 percent come to visit the Museum. The Museum receives some 16,000 visitors a year, over three times the Islands' population. There is no question that heritage values draw tourists. With proper management, the relationship between tourism and the heritage profession could be symbiotic. Forecasts predict that employment in tourism will increase in the future while employment in forestry will decrease. Thus tourism may go a substantial way towards alleviating some of the employment losses in forestry should a park be established. It would also encourage the development of small business.

It is not customary to place an economic value on heritage sites. Since they are almost universally considered to be national treasures, irreplaceable treasures, they have no market value. Thus they cannot be directly compared to values in forestry or mining. The price of keeping these sites intact may well be the establishment of park status. But with that park status would come the protection of yet other values, forming a complex of heritage and natural sites which could achieve the same international standing as the Anthony Island World Cultural Heritage Site under UNESCO.

Skidegate Band Council

Many of our people make a living from the forests. It is without prejudice to the forest industry that we have taken our position for maximum preservation.

Option 4 has already been violated during the planning process and while this may have instilled some feelings of betrayal, we remain open to the process. This is not to say that we condone the logging that has already occurred on Lyell.

Western Forest Products' presence on Lyell has proven out the worst of our fears as mass wasting, the loss of habitat and wanton change becomes more apparent. The company's cut design on the northeast slopes of the Gate Creek watershed caused trees to blow down into Windy Bay, as expected.

The Forest Service's over-commitment of the Queen Charlotte Islands forests, and the forfeit of opportunities for trade in the Hecate Timber Supply Area, will make 'compensation' a tough issue. We feel that the impact of 'cost' could be minimized by a sharing formula with other existing T.F.L. and T.S.H.L. holders.

While economic considerations will weigh heavily upon the outcome of this exercise, we ask that those who assume the power of decision maintain a global perspective in a context of all time.

The value of these lands to our people cannot be presented in economic terms, nor can they be expressed to any substantial degree in a report such as this. We do not expect those values to be in the forefront of factors affecting the B.C. government's decision, however the value of the intact lands stand on its own merit.

No words nor visual presentations can justifiably express the dynamics of these lands which has compelled so many people to come to its aid.

The Haida People respectfully invite all those who will be involved in the decision-making process to visit and experience the Gwaaia Haanas South Moresby Wilderness Area.

Any further moves towards a formal land designation should be properly addressed through the Council of the Haida Nation.

WFP

Western Forest Products Limited

The South Moresby Resource Planning area encompasses a significant area committed to timber harvesting since 1959 under the terms of Tree Farm Licence 24. The Ministry of Forests thereby entrusted Western Forest Products (WFP) with the management of the area and WFP accepted the responsibility pursuant to the T.F.L. agreement subject to the FOREST ACT, policies, regulations and constraints administered by the Forest Service.

The ELUC Secretariat, in their report "South Moresby Island Wilderness Proposal - an Overview Study", endorsed timber harvesting. The concept proposed in the Overview Study was one in which wilderness features would be accommodated and protected by integrated resource planning without foregoing the timber harvesting potential. The Secretariat observed that administrative procedures exist that permit forest management to be undertaken on the area without detracting significantly from wilderness values or damaging biological and recreational features.

The ELUC Secretariat questioned the need to set aside the entire South Moresby area when "significant features of the area can be maintained through careful planning and management". The fact that 75 percent of the South Moresby area has minimal timber and mineral values, and because less than one percent of the entire area will be logged annually, supports WFP's position that the significant features of the area will be preserved without invoking major withdrawals from T.F.L. 24.

The Ministry of Forests initiated a South Moresby Resource Planning Team as recommended by the ELUC Secretariat with a duty to provide proposals for land-use designations with regard to the conclusions of the Overview Study. The proposals were to be based on resource inventory and analysis, and include an appraisal of existing values and needs with which to accredit single-use designations.

Despite participation on the planning team, WFP is of the opinion that none of the four options ultimately produced provide either a realistic resource plan or expands on the ELUC Secretariat Overview Study recommendations as perceived by WFP.

WFP could concur with a resource use plan that:

a) acknowledged the integrity of prior agreements currently in place and represented by T.F.L. 24, T.S.A. apportionments, valid mineral claims and timber licences;

b) involved withdrawal from T.F.L. 24 of no more than five percent of the allowable annual cut as provided by Section 53 of the FOREST ACT;

c) provided for a 2.6 square mile ecological reserve at Dodge Point-Windy Bay, designated by the Team as Option B, to preserve representative ecosystems while encompassing a tidal estuary, archaeological values and Ancient Murrelet nesting sites;

d) accommodated a marine park as discussed with the Parks Branch in 1975, encompassing De La Beche Inlet including Murchison, Agglomerate, House, Hotspring and Bischof Islands;

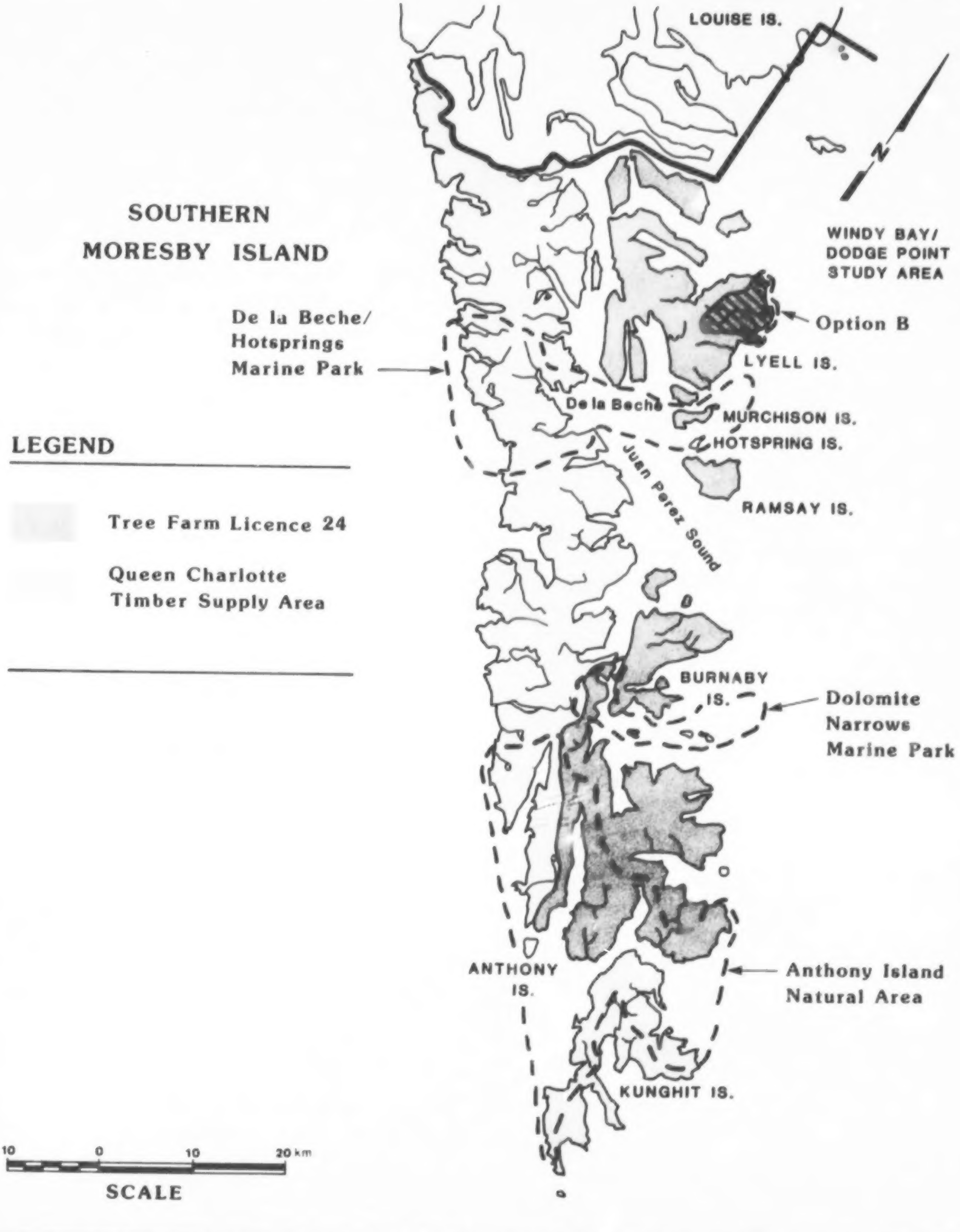
e) allowed for a timbered buffer strip along both sides of the Dolomite Narrows;

f) preserved the landscapes visible from Anthony Island and the approach through Houston Stewart Channel from disturbance;

g) accommodated timber harvesting on the remainder of the area consistent with current administrative provisions and the terms and conditions inherent with the Tree Farm Licence document;

h) conceded that the constraints of time, cost, weather and accessibility inhibited the realization of the recreational use potential of South Moresby as contrasted to the demonstrated value for growing successive crops of trees and potential for mineral development.

WFP CONCEPT OF CORE RECREATIONAL AREAS


SOUTHERN
MORESBY ISLAND
LOUISE IS.
WINDY BAY/
DODGE POINT
STUDY AREA
Option B
LYELL IS.
De la Beche/
Hotsprings
Marine Park
De la Beche
MURCHISON IS.
HOTSPRING IS.
RAMSAY IS.
Juan Perez Sound
N
LEGEND
Tree Farm Licence 24
Queen Charlotte
Timber Supply Area
BURNABY
IS.
Dolomite
Narrows
Marine Park
ANTHONY
IS.
Anthony Island
Natural Area
KUNGHIT IS.
10
0
10
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SCALE

POOR

QUALITY

ORIGINAL